Trend in medically indicated oocyte and embryo freezing and a case of pregnancy for cancer patient using frozen-thawed oocytes under COVID-19 pandemic at our clinic

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Background

Oocyte and embryo freezing as a means of fertility preservation for cancer patients is an important issue in medical care.

Methods

We reviewed the clinical implementation of oocyte and embryo freezing for medical reasons by using clinical database, and present a representative case.

Our clinic performs oocyte and embryo freezing for medical reasons as a means of fertility preservation for cancer patients.

| Result | ts |
|--------|----|
|--------|----|

| Cycle | Date of first visit | Age | Date of OPU | Diagnosis | AMH | Protocol of ovary stimulation | | OPU | мII | IVM | IVM-M II | Frozen |
|-------|---------------------|-----|-------------|--------------|------|-------------------------------|------|-----|-----|-----|----------|--------|
| 1 | 20140217 | 36 | 20140306 | Brest cancer | 0.84 | Mild | CD14 | 1 | 1 | 0 | | 1 |

Our clinic identified 28cycles, 26 cases of oocyte and embryo freezing for medical reasons by using clinical database from 2014 to 2024. The age range was 25-47 years.

The number of oocytes retrieval cycles was 28, of which 262 oocytes were frozen.

Of the retrieved oocytes, 43 were immature and underwent rescue in vitro maturation (R-IVM) as an original method at our clinic, and 34 were able to mature.The mature rate was 79.1%.

The number of days from the first consultation to oocyte retrieval was often within 14 days in most cases.

| 2 | 20140527 | 39 | 20140615 | Brest cancer | | HMG antagonist | | 11 | 9 | 2 | 2 | 11 |
|----|----------|----|----------|--------------------|------|---------------------------------------|------|----|----|----|----|-----------|
| 3 | 20140701 | 41 | 20140714 | Brest cancer | 0.1 | HMG antagonist letrozole | CD21 | 5 | 3 | 2 | 1 | 4 |
| 4 | | | 20140819 | | | HMG antagonist letrozole | | 2 | 2 | | | 2 |
| 5 | | | 20141122 | | | HMG antagonist letrozole | | 2 | 2 | | | 2 |
| 6 | 20141120 | 25 | 20140213 | AML | 1.02 | short protocol | | 4 | 3 | | | 3 |
| 7 | 20150116 | 29 | 20150126 | Brest cancer | 2.49 | HMG antagonist letrozole | | 12 | 6 | 5 | 5 | 11 |
| 8 | 20150918 | 37 | 20150928 | Brest cancer | 7.66 | HMG antagonist letrozole | | 5 | 4 | 1 | 1 | 5 |
| 9 | 20160203 | 33 | 20160215 | Brest cancer | | HMG antagonist letrozole | CD15 | 8 | 7 | | | 7 |
| 10 | 20160728 | 25 | 20160815 | Brest cancer | | short protocol | | 24 | 23 | | | 23 |
| 11 | 20160921 | 36 | 20161014 | Brest cancer | | short protocol letrozole | CD15 | 11 | 8 | 3 | 2 | 10 |
| 12 | 20170220 | 24 | 20170316 | Corpus cancer | | short protocol | CD11 | 44 | 39 | | | 30 |
| 13 | 20170328 | 34 | 20170428 | Brest cancer | | short protocol | CD18 | 10 | 9 | | | 9 |
| 14 | 20170525 | 35 | 20170604 | Malignant lymphoma | | random start PPOS letrozole | CD14 | 28 | 22 | | | 21 |
| 15 | 20170902 | 43 | 20170923 | Brest cancer | | short protocol | CD17 | 4 | 1 | 3 | 2 | 3 |
| 16 | 20171019 | 39 | 20171102 | Brest cancer | 1.06 | random start HMG antagonist letrozole | CD10 | 1 | 1 | | | 1 |
| 17 | | | 20171128 | | | PPOS letrozole | CD17 | 4 | 4 | | | D5 2 |
| 18 | | | 20171223 | | | PPOS letrozole | CD21 | 6 | 6 | | | 6 |
| 19 | | | 20180120 | | | PPOS letrozole | CD17 | 6 | 6 | | | 6 |
| 20 | 20171110 | 31 | 20171120 | Malignant lymphoma | | PPOS | CD13 | 14 | | | | 14 |
| 21 | 20171127 | 38 | 20171208 | Brest cancer | | random start HMG antagonist letrozole | CD14 | 22 | 17 | | | 17 |
| 22 | 20171212 | 39 | 20180129 | Brest cancer | 1.24 | PPOS letrozole | CD13 | 6 | 5 | | | 5 |
| | 20180605 | 45 | | Counseling | | | | | | | | |
| | 20190423 | 47 | | Counseling | | | | | | | | |
| | 20190729 | 43 | cancel | Brest cancer | | random start PPOS letrozole | | | | | | |
| 23 | 20211105 | 39 | 20220419 | Brest cancer | 6.5 | random start PPOS letrozole | CD15 | 5 | 4 | | | 4 |
| 24 | | | 20220611 | | | PPOS letrozole | CD13 | 11 | 7 | 4 | 3 | 10 |
| | 20210729 | 44 | | Counseling | | | | | | | | |
| 25 | 20230420 | 37 | 20230513 | Brest cancer | 3.01 | random start HMG antagonist letrozole | CD15 | 7 | 4 | 2 | 2 | 6 |
| 26 | 20230501 | 33 | 20230514 | Corpus cancer | | random start PPOS letrozole | CD15 | 28 | 15 | 13 | 10 | 25 |
| 27 | 20240130 | 33 | 20240213 | Corpus cancer | | random start PPOS letrozole | CD15 | 21 | 13 | 8 | 6 | 19 |
| | 20240307 | 33 | | Counseling | 3.2 | | | | | | | |
| 28 | 20240302 | 31 | 20240310 | Malignant lymphoma | 2.29 | HMG antagonist letrozole | CD13 | 13 | 10 | | | D3,3,D5,2 |

Our IVM (**R-IVM**)



The protocol for R-IVM





R-IVM culture medium Oocyte maturation medium + 75 mIU/ml FSH + 75 mIU/ml hCG



37°C, 5% O₂, 6% CO₂ Max 48hr (culture times)



Go to ART

Case presentation

A case of pregnancy using frozen-thawed oocytes under COVID-19 pandemic was observed in a cancer patient (36 years old).

She underwent breast cancer removal surgery at another hospital in September 2016 and came to our clinic on September 21 for fertility preservation; 11 oocytes could be retrieved on October 14, 2016, and 10 oocytes were frozen for medical reasons, including those that were subjected to R-IVM.

The patient then underwent radiation therapy on October 24, 2016, and experienced a clinical pregnancy on April 20, 2020 after thawing the frozen oocytes, performing Intracytoplasmic Sperm Injection (ICSI), and embryo transfer (9-split and grade 3 at transfer) with the hope of getting a child.

Conclusion

We continue research to improve the clinical outcomes of cancer patients.

Especially, we expect that the number of days from the first consultation to oocyte retrieval for cancer patients will be further shortened by smooth communication with oncologists.

> Conflict of Interest We have no COI!