

## Non-donor IVF treatment cycles in the UK need to be re-evaluated against the 1.625 million oocytes retrieved

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### Study question:

Are IVF clinics collecting too many oocytes per retrieval procedure?

### Summary answer:

IVF cycles performed in the UK appear to be retrieving far too many oocytes, most of which may never be used and are probably discarded.

### What is known already:

For justifying IVF with low AMH, older women, poor responders, the Bologna and POSEIDON consensus were developed. The positive linear correlation between cumulative live birth rates and numbers of oocytes collected is well established, thereby focussing intensely on stimulation regimes and the growth of FER cycles and oocyte freezing activities. The associated risk of OHSS is well-known. However, over-stimulation practices and numbers of oocytes retrieved within IVF remain unknown as is the impact on patients' health, emotional and financial welfare. This UK dataset uniquely reveals numbers of oocytes retrieved against IVF cycles undertaken, and which may well reflect global practices.

### Study design, size, duration:

This is a retrospective observational cohort study of oocyte retrieval procedures for non-donor IVF cycles in the UK between 2015 and 2018. Data were obtained from UK HFEA under the Freedom of Information Act 2000. For fresh oocytes, data were obtained for the number of cycles retrieving 1-5, 6-15, 16-25, 26-49, 50-59, and 60+ oocytes. The number of cycles that led to no oocytes was obtained as well as data on the utilisation of oocytes.

### Participants/materials, setting, methods:

The data from the HFEA covers up to 86 UK IVF clinics undertaking non-donor IVF. IVF clinics are legally obliged to provide IVF dataset as part of the licence requirement. The unbiased data was gathered independently by HFEA staff under the Freedom of Information Act 2000. Specifically, the number of treatment cycles with; 0, 1-5, 6-15, 16-25, 26-49, 50-59, and 60+ oocytes retrieved for each year was requested. Additional limited data could be gained.

### Main results and the role of chance:

For 2015-2018 there were 172341 fresh oocyte retrieval cycles, where 10148 (5.9%) cycles from 9439 patients did not yield any oocytes. In this period, 42574 cycles (24.7%), 91797 cycles (53.3%), 23794 cycle (13.8%) and 3970 cycles (2.3%) yielded 1-5 oocytes, 6-15 oocytes, 16-25 oocytes, 26-49 oocytes respectively, while 58 cycle (0.033%) yielded over 50 oocytes. The data was accountable by 5-85 clinics and the outcomes and patterns remained uniform across the 4 years. The main desired oocyte yield of 6-15 oocytes occurred in 53.3% of IVF cycles distributed evenly across the clinics. However, 16.1% of cycles were associated with 16-49 oocytes retrieved per IVF cycle, while 58 (0.03%) cycles led to greater than 50 oocytes retrieved. The maximum number of oocytes collected was not provided by the HFEA due to technical reasons.

The total number of oocytes collected over 4-years numbered 1,624,912 oocytes from 147274 women yielding on average 11 oocytes per patient. These oocytes were fertilised to yield 931,265 embryos (57.3% converted). The fate of 42.7% oocytes remains unknown. Of the embryos created, 209,080 (22.4%) were transferred over 172,333 cycles, while 219,563 (23.6%) embryos frozen and the fate of 53.97% of embryos remained unaccounted for.

### Limitations, reasons for caution:

This retrospective analysis spans 4 years in which stimulation regimes, patient characteristics, or outcomes were unavailable. Only a qualitative analysis is possible with the HFEA dataset, but the corresponding data is

unique and of public interest. The outcome of unaccounted oocytes appears a limitation in the regulatory body data set.

**Wider implications of the findings:**

This unique observation on IVF clinics practices suggests that the high oocyte number per retrieval procedure needs re-evaluation. In particular, this needs to focus on the side-effects, including OHSS and procedure-related complications. In addition, the outcome and cost of unused frozen oocytes need to be established.

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