The first fraction of ejaculate is the most effective for conception

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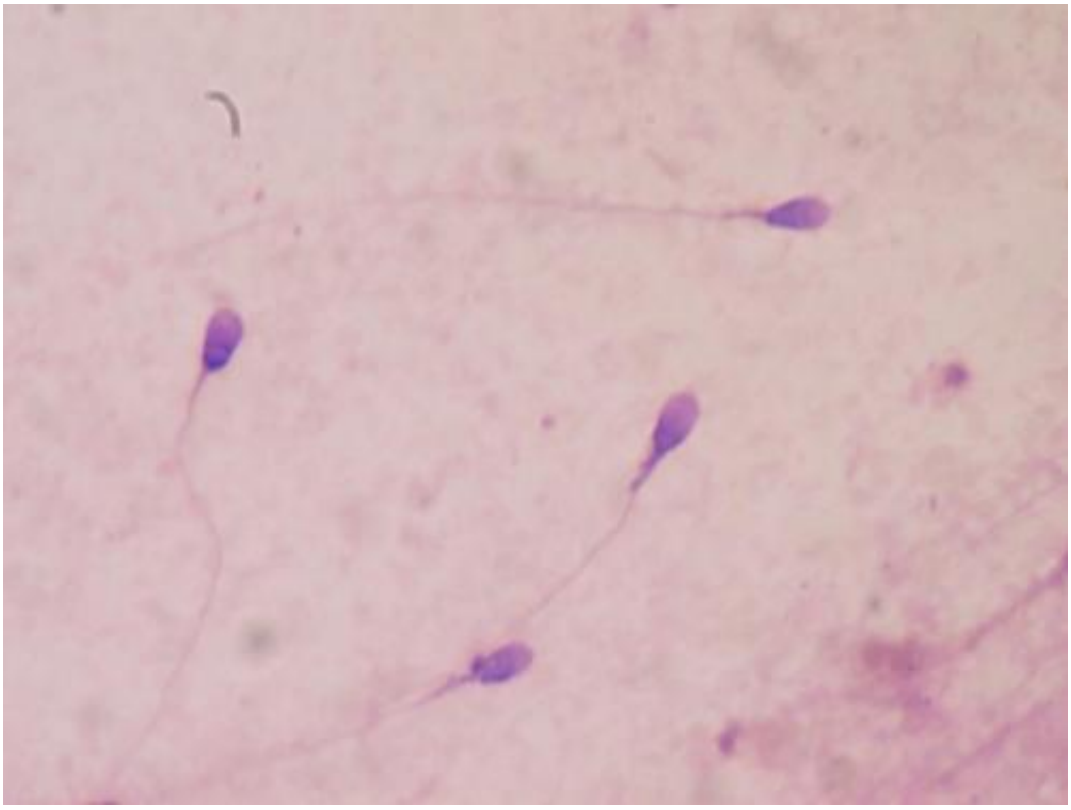

Human sperm stained for semen quality testing in the clinical laboratory. Credit: Bobjgalindo/Wikipedia

Sperm in the first fraction of ejaculate are more numerous, move more and present better quality DNA than those lagging behind. This is the conclusion of a study led by the Ginemed fertility clinic, which confirms that while the objective of the first fraction is to fertilise the egg, the

second phase is so that no sperm from any other male has a chance to fertilise it.

A study led by the Ginemed Assisted Human Reproduction Clinic analyzes the advantages of using fractions of ejaculate separately in in-vitro fertilisation as a way to improve the sample of the semen.

The researchers' hypothesis was that, comparing the different fractions of semen in an ejaculation, the first would contain sperm with better seminal parameters and could be used as an effective method for selecting sperm prior to fertilisation.

"Ejaculate has always been considered as a whole. However, we believe that it is divided into two quite different phases due to its composition and physiological functions, aimed at achieving two equally important actions in terms of reproduction," María Hebles, co-director of the reproduction laboratory at the Ginemed Clinic in Seville and lead author of the study, explains to SINC.

The first objective of ejaculate would be to fertilise the egg and the second so that no other male has the opportunity to fertilise it. Therefore, the first fraction is characterised as having protective components such as zinc, whereas the second contains elements that can cause damage to sperm.

However, for their use in assisted reproduction techniques, the liquid is normally collected in a single container, and therefore both phases are mixed together. This could have a detrimental effect on the sperm population," adds Hebles.

Based on this, the specialists asked 40 participants to collect the ejaculate separately into two containers, one for each phase. They then separated the first and the second phase and studied the characteristics

of the sperm in each of them.

Data suggests that the first phase contains an enhanced subpopulation of sperm, with less sperm DNA fragmentation. Therefore, the use of sperm from this fraction can have a positive effect on fertilisation and embryonic development.

"As we were expecting, the sperm from the first fraction of ejaculate were faster moving and the count was higher, and more importantly, they had higher DNA integrity than sperm from the second phase," says the researcher.

In light of the results, the experts now have a protocol requesting all patients to collect the ejaculate in two fractions, "improving the quality of the sperm used for fertilisation simply and at no cost at all," Hebles adds..

Ejaculation phases

The fluid expressed during ejaculation is composed of various fragments, shared between a pre-ejaculation phase and the first and the second fraction of the ejaculate. Although there are no definitive studies to this regard, the pre-ejaculatory phase or pre-seminal fluid does not contain sperm; it is a colourless secretion from the Cowper's glands which is expelled to lower the acidity of the urethra.

On the other hand, the first fraction represents between 15 and 45% of ejaculate volume, is rich in sperm, acid phosphatase, citric acid, magnesium and zinc, which effectively protect the sperm. The second fraction consists of the remaining volume, between 70 and 90% and is composed of secretions from the seminal vesicles rich in reactive oxygen species which have a negative effect on the seminal characteristics.

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More information: 'Seminal quality in the first fraction of ejaculate'. *Syst Biol Reprod Med*, Early Online: 1-4 2014 DOI: 10.3109/19396368.2014.999390

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