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"Physiologic ICSI": hyaluronic acid (HA) favors selection of spermatozoa without DNA fragmentation and with normal nucleus resulting in improvement of embryo quality.

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Abstract

OBJECTIVE:

To evaluate the role of hyaluronic acid (HA) for sperm selection before intracytoplasmic sperm injection (ICSI).

DESIGN:

Three prospective studies.

SETTING:

Private assisted reproduction center in Italy.

PATIENT(S):

Study 1: 20 men. Study 2: 15 men. Study 3: 206 couples treated with ICSI on a limited number of oocytes per patient (1-3) in accordance with Italian IVF law.

INTERVENTION(S):

Study 1: determination of sperm DNA fragmentation of HA-bound spermatozoa versus spermatozoa in polyvinylpyrrolidone (PVP). Study 2: assessment of nuclear morphology of HA-bound spermatozoa versus spermatozoa in PVP. Study 3: randomized study comparing conventional PVP-ICSI to ICSI in which the spermatozoa are selected for their capacity to bind to HA (HA-ICSI).

MAIN OUTCOME MEASURE(S):

Study 1: sperm DNA fragmentation rate. Study 2: sperm nucleus normalcy rate according to motile sperm organellar morphology examination criteria. Study 3: fertilization, embryo quality and development, and implantation and pregnancy.

RESULT(S):

Spermatozoa bound to HA show a significant reduction in DNA fragmentation (study 1) and a significant improvement in nucleus normalcy (study 2) compared with spermatozoa immersed in PVP. Furthermore, injection of HA-bound spermatozoa (HA-ICSI) significantly improves embryo quality and development (study 3).

CONCLUSION(S):

Hyaluronic acid may optimize ICSI outcome by favoring selection of spermatozoa without DNA fragmentation and with normal nucleus. Furthermore, HA may also be used to speed up the selection of spermatozoa with normal nucleus during intracytoplasmic morphologically selected sperm injection (IMSI).

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