

Intracytoplasmic sperm injection: a novel selection method for sperm with normal frequency of chromosomalaneuploidies.

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Abstract

OBJECTIVE:

To test a newly invented intracytoplasmic sperm injection (ICSI) sperm selection method based on sperm hyaluronic acid (HA) binding.

DESIGN:

Comparison of chromosomal disomy and diploidy frequencies in sperm arising from semen and in HA-bound sperm.

SETTING:

Academic andrology laboratory.

PATIENT(S):

Men presenting for semen analysis.

INTERVENTION(S):

Washed sperm fractions of 32 semen samples were applied to Petri dishes or glass slides coated with immobilized HA. The unbound sperm were rinsed gently, and the HA-bound sperm were removed with an ICSI pipette. The control sperm population was the unselected sperm. Both HA-selected and unselected sperm were treated with fluorescence in situ hybridization with centromeric probes for the X, Y, and 17 chromosomes.

MAIN OUTCOME MEASURE(S):

Chromosomal disomy and diploidy frequencies.

RESULT(S):

In the HA-bound sperm (495-2,079 per man, 41,670 in all) compared with unselected sperm (4,770 per man, 162,210 in all), the chromosomal disomy frequencies were reduced to 0.16% from 0.52%, diploidy to 0.09% from 0.51%, and sex chromosome disomy to 0.05% from 0.27% (a 5.4-fold reduction vs. 4-fold respective increase in ICSI offspring).

CONCLUSION(S):

The HA sperm selection method for ICSI, which is based on a relationship between sperm receptors for zona pellucida and HA, will likely reduce the potential genetic complications and adverse public health effects of ICSI.