The Centre for Reproductive & Genetic Health

Should cryopreservation of sperm be routinely offered to Klinefelter's patients?

Emily Drew, Suzanne Cawood, Alpesh Doshi, Paul Serhal

CRGH, emily.drew@crgh.co.uk

Case Report

A couple were referred to the unit as the male partner had been diagnosed with non-mosaic Klinefelter's Syndrome (47XXY). An IVF & ICSI cycle was embarked upon and the male partner underwent TESE (Schlegel *et al.* 1997). Post preparation of the testicular biopsies, all 7 oocytes collected were inseminated using the ICSI procedure 41 hours post hCG (Palermo *et al.* 1992). At 18hpi, six oocytes showed signs of normal fertilisation (2PN and 2PB). On day five of development two embryos were transferred to the uterus resulting in a live birth at 39 weeks + 5 days with a normal karyotype.

Despite published evidence of healthy live births from Klinefelter's patients using ICSI with testicular or ejaculate sperm, it is currently not common practice in the UK to offer surgical sperm retrieval and cryopreservation as an option for fertility preservation in these men (Fullerton *et al.* 2010).

One of the main oppositions to fertility treatment for patients with Klinefelter's Syndrome is the potential genetic risks to the offspring.

Although the risk of sex chromosome and autosomal aneuploidy has shown to be increased in comparison to the general population, this increase is comparable to that seen in surgically retrieved sperm from azoospermic men (range of 1.5% to 11.4%) with a normal karyotype (Levron *et al.* 2000; Palermo *et al.* 2002).

A similar increased frequency of autosomal aneuploidy (ranging from 0-10%) has also been demonstrated in 46XY males with oligozoospermia or oligoasthenoteratozoospermia (Pfeffer *et al.* 1999; Morel *et al.* 2003).

Both groups of patients are referred for ICSI treatment routinely, which questions why Klinefelter's patients are not commonly advised to undergo cryopreservation for fertility preservation.

In particular, patients in which Klinefelter's Syndrome is diagnosed at an early age should be recommended to cryopreserve ejaculate or testicular samples soon after puberty, when germ cell degeneration begins to increase dramatically.

References Fullerton, G., Hamilton, M. and Maheshwari, A. (2010). "Should non-mosaic Klinefelter syndrome men be labelled as infertile in 2009?" Human Reproduction **25**(3): 588-597; Levron, J., Aviram-Goldring, A., Madgar, I., Raviv, G., Barkai, G., *et al.* (2000). "Sperm chromosome analysis and outcome of IVF in patients with non-mosaic Klinefelter's syndrome." Fertility and Sterility **74**(5): 925-929; Morel, F., Bernicot, I., Herry, A., Le Bris, M.-J., Amice, V., *et al.* (2003). "An increased incidence of autosomal aneuploidies in spermatozoa from a patient with Klinefelter's syndrome." Fertility and Sterility **79**: 1644-1646; Palermo, G., Joris, H., Devroey, P. and Van Steirteghem, A. C. (1992). "Pregnancies after intracytoplasmic injection of single spermatozoon into an oocyte." The Lancet **340**(8810): 17-18; Palermo, G. D., Colombero, L. T., Hariprashad, J. J., Schlegel, P. N. and Rosenwaks, Z. (2002). "Chromosome analysis of epididymal and testicular sperm in azoospermic patients undergoing ICSI." Hum Reprod **17**(3): 570-575; Pfeffer, J., Pang, M. G., Hoegerman, S. F., Osgood, C. J., Stacey, M. W., *et al.* (1999). "Aneuploidy frequencies in semen fractions from ten oligoasthenoteratozoospermic patients donating sperm for intracytoplasmic sperm injection." Fertil Steril **72**(3): 472-478; Schlegel, P. N., Palermo, G. D., Goldstein, M., Menendez, S., Zaninovic, N., *et al.* (1997). "Testicular sperm extraction with intracytoplasmic sperm injection for nonobstructive azoospermia." Urology **49**(3): 435-440.