

The Effect of Calcium Channel Blockers on Male Reproductive Potential

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The potential impact of calcium channel blockers on male fertility has been a topic of discussion for some time. In this edition of *Androlog*, Dr Grace Centola describes her efforts in the management of such a patient and requests advice from *Androlog* participants regarding this clinical situation.

Dr Grace Centola enquires:

We have a patient that told us he was on Norvasc (calcium channel blocker) for high blood pressure, only after we kept asking if anything had changed from 3 years ago. We pressured for a current semen analysis, and it showed no sperm; a testicular sperm extraction (TESE) was performed and we did find nonmotile sperm; then we were told about the medication. Adding to the frustration, the wife will be ready for egg retrieval early next week, and donor sperm is not an option. Any suggestions? Will intracytoplasmic sperm injection (ICSI) work? One of the reproductive endocrinologists wondered if we washed the sperm in media supplemented with additional (or high levels) of calcium, would that override the calcium channel block? Anyone ever try that, or is the drug bound tightly to the channel, and cannot be removed so easily? Any help is greatly appreciated.

Mike Reed replies with specific recommendations for the processing of the specimen in such a patient.

Regarding nonmotile testicular sperm [from a patient taking Norvasc], if I had no backup specimens, I would be prepared to do a hypo-osmotic version of sperm selection for ICSI. The better hypo-osmotic swelling test (HOS) for ICSI, in my opinion, is to make a 1:1 of your manipulation medium and sterile cell culture water. This should drop the osmolality to, or near to, that of the regular HOS test. Incubate the testicular sperm in this preparation (30 minutes, then start looking) in a microdrop on the injection dish. You can pick up reactive sperm with an assisted hatching pipette, and move them to a normal microdrop of manipulation medium. Once you have found enough sperm, then you can move the sperm to a drop of polyvinylpyrrolidone

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(PVP), and proceed with the ICSI, but I would be extra diligent in whacking the tails.

Mike Jutras offers the opinion that the use of a calcium channel blocker likely has little to do with the pathology seen in this patient.

I have seen several of these men and the calcium channel blocker did not seem to affect count or motility. My understanding is the problem is limited to fusion with the egg. He has another problem and just happens to be on calcium channel blocker. I assume that 3 years ago you had a normal semen analysis on him. I would process with pentoxifylline as usual for a sample with no motility.

I have had one patient who started in another lab with unexplained infertility with delivery, finally with in vitro fertilization (IVF). When they came back a couple of years later it was clear that they had a male factor. Each semen analysis showed a worsening problem and IVF was not working through 4 cycles. When we got him for IVF, he was azoospermic with sperm on biopsy. Six months later, no sperm on biopsy. Hormonally normal except for rising follicle stimulating hormone. So some of these guys do spiral down to nothing.

Paul Turek offers additional specific advice on the management of such patients.

It is my understanding that calcium channel blockers affect the acrosome reaction and/or capacitation and therefore ICSI should work. From our experience, fresh TESE sperm (regardless of motility) is at least 90%+ viable and results in similar 2pn rates with IVF-ICSI as motile testis sperm. Also, frozen thawed TESE sperm is roughly 50% viable (regardless of motility) and therefore is 'riskier' to use with ICSI if the entire population is nonmotile (Bachtell et al, 1999). Grace might consider a) thawing TESE sperm the night before egg retrieval and performing chemical manipulation on it (pentoxyl, adenos) as she wishes; b) if no motile sperm 12–24 hours later, consider fresh TESA to get largely viable sperm for ICSI (regardless of motility).

Ali Ahmady offers his suggestion for the management of patients with no motility in a TESA specimen.

I have had a few frozen TESA patients with zero motility. I activated the eggs with calcium ionophore after ICSI and got pregnancies. I hope this will work.

Reference

Bachtell N, Conaghan J, Turek PJ. The relative viability of human spermatozoa from the testis, epididymis and vas deferens before and after cryopreservation. *Hum Reprod.* 1999;14:101–104.