

ORIGINAL ARTICLE

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Factors impacting couples' decision-making between vasectomy reversal versus sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection

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SUMMARY

The purpose of this study was to identify factors which impact a couples' decision-making between the options of vasectomy reversal vs. sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection when counseled both by a reproductive urologist and a reproductive endocrinologist. A retrospective chart review was performed of couples who wish to achieve a pregnancy with a male partner with a history of prior vasectomy, in a couples' private fertility center. Of patients presenting for fertility options with a history of vasectomy, 175 couples elected to be counseled by both a reproductive urologist and a reproductive endocrinologist on the options between vasectomy reversal and sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection, with 78.3% of the couples opting for vasectomy reversal and 21.7% opting for sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection. The overall mean age of the male partners was 40.5 years of age, and the mean age of the female partners was 33. The mean obstructed interval was 9.7 years. Twenty-three percent of the female partners in couples selecting vasectomy reversal had diminished ovarian reserve, and 31.6% of couples selecting sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection had female partners with diminished ovarian reserve, two of which elected to have donor oocyte in vitro fertilization/intracytoplasmic sperm injection. Male age, female age, and ovarian reserve status did not have significant roles in this decision-making (p value 0.3578, 0.1185, and 0.3041, respectively); however, a longer obstructed interval since vasectomy was a significant factor associated with couples opting for sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection (0.0238). In this study, the majority of couples who were counseled on vasectomy reversal vs. sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection by a reproductive urologist and reproductive endocrinologist chose vasectomy reversal. Neither male partner age, female partner age, nor ovarian reserve status seemed to impact the decision; however, a longer obstructed interval was a significant factor that was associated with the decision of couples toward sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection rather than vasectomy reversal.

INTRODUCTION

Five hundred thousand men in the United States undergo vasectomy annually. Approximately 6% of these men will change their minds about their choice of having undergone surgical contraception, largely due to the 50% divorce rate in the United States and the eventual desire for pregnancy with a new partner (Sheynkin *et al.*, 1998; Shin *et al.*, 2005). The two options facing couples who want to conceive when the male partner has previously undergone vasectomy are vasectomy reversal (VR) or sperm retrieval (SR) with in vitro fertilization/intracytoplasmic sperm injection (IVF/ICSI). There are numerous factors that may impact a couples' decision-making on which route is most

appropriate for that couple. In many instances, the male partner is only evaluated by a urologist and counseled and treated with a VR without an evaluation or counseling of the female partner, or the female partner is evaluated by a reproductive endocrinologist on the option of IVF/ICSI, and the male partner is referred to a urologist to perform SR for use with IVF/ICSI.

MATERIALS AND METHODS

A retrospective chart review was performed in a private fertility center for couples. All couples who presented for fertility options when the male partner had previously undergone vasectomy were encouraged to have their partner seen by the respective

fertility specialist. Between January 2011 and February 2017, all male patients who had previously undergone vasectomy and been seen by a reproductive urologist for a VR consult as well as all female patients who had been seen by a reproductive endocrinologist for IVF/ICSI with SR consult, in a couples' fertility center, were offered an evaluation of their respective partner by the other respective specialist. SR was performed by percutaneous testicular sperm extraction (TESE) with a 14-gauge punch biopsy of the testis. Patients were counseled on all the risks and benefits of both options including: the potential to conceive spontaneously with intercourse, the average time to pregnancy per option, the technical aspects of both options, the potential need for another vasectomy in the future if the male patient elected for contraception again after pregnancies following VR, costs for both options, potentials to have multiple children sequentially, and the level of treatment involvement for both partners depending on the option. The cost of SR/IVF/ICSI plus ovarian stimulation medications was 2.3× the total cost of VR including surgeon fee, anesthesia fee, and surgical facility fee. All patients presenting for consultation on vasectomy reversal were counseled in a similar manner with success rates quoted based on the surgeon's data based on obstructive interval. The men were evaluated by history of fertility prior to vasectomy and physical examination, with no other laboratory testing performed, as reported to be the indicated evaluation of patients presenting for vasectomy reversal by the American Society for Reproductive Medicine committee statement on vasectomy reversal Practice Committee of the American Society for Reproductive Medicine (2008). Due to the collection of de-identified data, Institutional Review Board exemption was obtained for this study. Statistical analyses were performed via Student's *t*-test with a *p* value of <0.05 considered statistically significant.

RESULTS

Of all patients presenting for fertility options when the male partner had a history of prior vasectomy, a total of 175 of the patients elected to have their partners evaluated. An additional 109 men elected to proceed with VR without female partner evaluation after being counseled by a reproductive urologist on VR and the option of having a female fertility evaluation by a reproductive endocrinologist. Of the 175 who had both partners evaluated, the mean age of the male partners was 40.5 (SD 6.5, range 26–62), and the mean age of the female partners was 33 (SD 4.8, range 19–46). Mean obstructed interval was 9.7 years (SD 6.1, range 1–29). Ultimately, 137 of 175 (78.3%) of couples opted for VR, and 38 of 175 (21.7%) elected SR/IVF/ICSI, two of whom underwent donor oocyte IVF/ICSI. Diminished ovarian reserve (DOR) was defined as day 3 follicle stimulating hormone (FSH) > 10 mIU/mL, until January 2013, at which time antimüllerian hormone (AMH) < 1 ng/mL was used as the criterion for DOR. Twenty-five percent of female partners were categorized as having DOR. Twenty-three percent of couples selecting VR had female partners with DOR, and 31.6% of couples who selected SR/IVF/ICSI had female partners with DOR, two of which opted for donor oocyte IVF/ICSI. There was not a statistically significant difference in male or female partner ages between those that selected VR vs SR/IVF/ICSI. Of the female partners evaluated, 24 of them had hysterosalpingograms performed, one of which revealed a unilateral tubal obstruction, the remainder of which showed

bilateral tubal patency. There was a statistically significantly longer mean obstructed interval since vasectomy in couples who selected SR/IVF/ICSI vs. VR (Table 1).

There was not a statistically significant difference in decision-making in choosing VR vs. SR/IVF/ICSI when the female partner was found to have DOR (*p*-value 0.3041).

DISCUSSION

VR was first described in the 1930s, and success rates significantly improved with the application of the operative microscope for microsurgical anastomoses in the 1970s which significantly improved patency rates (Twyman & Nelson, 1938; Boyarsky, 1973; Kim & Goldstei, 2009). SR began being performed for obstructive azoospermia to be used with IVF/ICSI in the 1990s (Cooper, 1990; Hirsh *et al.*, 1994; Silber, 1994). When the male partner of a couple who is interested in conceiving has undergone a vasectomy in the past for contraception, the two options available are either VR or SR/IVF/ICSI. By undergoing evaluation and receiving extensive counseling on both options by a reproductive urologist and a reproductive endocrinologist, the couple can make an informed and educated decision on which option is going to be the most appropriate for them. To our knowledge, this is the first study which evaluates factors impacting decision-making for couples facing these choices when both partners are fully counseled by male and female fertility specialists in both options, and in one couples' fertility center. Rather than a reproductive urologist counseling a couple on VR vs. SR/IVF/ICSI or a reproductive endocrinologist doing the same, both partners are appropriately counseled by each specialist in a manner that fully informs them with their respective option. A number of factors may play a role in this decision-making process for each couple. These factors may include male age, female age, ovarian reserve status, time since vasectomy and associated VR success rates, potential time to conception with either option, family planning, and the number of children a couple desires to have, the potential need for another vasectomy for contraception once a couple is done building their family after vasectomy reversal, the need for one or both partners to undergo treatment, and cost. Our goal was to assess the objective measurable factors which may contribute to the decision-making process. Neither the age of either partner nor ovarian reserve status played a significant role in decision-making. However, the obstructed interval since the vasectomy did seem to impact decision-making. The assumption is that the concern for VR failure or potential need for vasoepididymostomy in cases of longer obstructed intervals drove the decision-making toward SR/IVF/ICSI. The couples were quoted the single surgeon (PKK) VR patency rates based on quality assurance in-practice data on the surgeon's patency rates which were 97% patency for an obstructed interval of 0–8 years, 95% patency for 9–15 years, and 75% for those beyond 15 years with a much higher percentage of those men in the longer obstructed interval group requiring

Table 1 Partner age and Obstructed Interval in VR versus SR group

	VR (Mean, SD, Range)	SR (Mean, SD, Range)	<i>p</i> -value
Male age	40.2 (6.0, 26–62)	41.3 (8.1, 29–61)	0.357
Female age	32.7 (4.8, 19–44)	33.9 (5.5, 24–46)	0.188
Obstructed interval	9.1 (5.6, 1–29)	11.6 (7.2, 1–29)	0.023

vasoepididymostomies rather than vasovasostomies. IVF success rates were quoted based on the IVF laboratory's pregnancy and live birth rates over the previous 3 years, stratified by female age. As either treatment option impacts both partners and pregnancy rates, evaluating and counseling both partners by specialists in male and female fertility are the optimal practice pattern to allow for full informed consent in the decision-making process where the reproductive urologist and reproductive endocrinologist partner with the couple to help guide them on the route that will be most fit for each couple.

CONCLUSIONS

In this study, when couples that are considering options to conceive after the male partner has previously undergone a vasectomy are counseled on vasectomy reversal vs. sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection by a reproductive urologist and a reproductive endocrinologist, respectively, the majority selected vasectomy reversal. Male age, female age, and ovarian reserve status did not seem to play a significant role in this decision-making; however, a longer obstructed interval since vasectomy was a factor that was associated with the decision-making of couples toward sperm retrieval/in vitro fertilization/intracytoplasmic sperm injection.

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