

Conference Paper

Success Rate of Pregnancy after PESA/TESE and ICSI in Jakarta

Ari Basukarno, Ponco Birowo, and Nur Rasyid

Department of Urology, Faculty of Medicine, Universitas Indonesia, Cipto Mangunkusumo Hospital, Jakarta

Abstract

Male infertility is a major problem in infertility. It can be caused by obstructive azoospermia. Sperm retrieval surgery (SRS) is the best approach to gain the sperm used Intra Cystoplasmic Sperm Injection (ICSI). However, the success rate of pregnancy after SRS and ICSI in Cipto Mangunkusumo National Hospital has not yet been defined. There were 123 patients had SRS with most of them performed PESA. Sperm were found in more than 77% of patients with most of them directly performed ICSI. Only 40 patients could be contacted with average age of husband, wife, and duration of marriage were 40.3 + 8.2, 33.2 + 5.1, 7.6 + 4.6 years old respectively. Most of patients were suffered from primary infertility. The success rate of pregnancy is 72.5%, with success rate of birth is 30.0%. There are 2 patients waiting for delivery date. Sperm retrieval surgery such as PESA/TESE is the best approach to gain sperm in obstructive azoospermia patient. The success rate of pregnancy after PESA/TESE and ICSI is high with almost half of patients have succeed in giving birth.

Corresponding Author: Ponco Birowo; email: ponco.birowo@gmail.com

Received: 24 August 2016

Accepted: 25 September 2016

Published: 4 October 2016

Keywords: infertility, azoospermia, ICSI, PESA, TESE

Publishing services provided by Knowledge E

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Selection and Peer-review under the responsibility of the ASPIRE Conference Committee.

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1. Introduction

Infertility itself is defined as a condition in which during 12 months of regular sexual intercourse without any protection that could prevent pregnancy, the couple still could not successfully get pregnant or maintain the pregnancy until labor [1,2]. Each country has different in prevalence of infertility. This condition is related to local risk factors. In developed countries, the prevalence of infertility is around 11,5% to 16,7% with the average age of male with primary infertility is 32 years old and 34 years old for secondary infertility [3,4]. Prevalence of infertility is around 9% of total productive-age of Asian population [5]. Globally, the prevalence of infertility is around 10% of total population [6].

A very long time ago, Steptoe and Edward made a great contribution to human race as their success of the birth of the first human baby through in vitro fertilization (IVF) [7]. Since then IVF become a well-known procedure used in order to treat infertility. However, not all cases of infertility could be helped by IVF procedure, in example is an infertility caused by male factors. Male patients suffered from azoospermia could not be help using IVF program. They need other procedures called sperm retrieval surgery in order to collect their sperm. Intracytoplasmic sperm injection (ICSI) is a treatment

in order to inject a single sperm into each oocyte during an IVF cycles. ICSI was firstly reported by Palermo et al in 1992 [8].

The well-known sperm retrieval surgery (SRS) are percutaneous epididymal sperm aspiration (PESA), microsurgical epididymal sperm aspiration (MESA), and testicular sperm extraction (TESE) [9]. Unfortunately, artificial reproductive technology is expensive for most couples since it is not covered by most insurance policy. In Indonesia, public health insurance coverage does not include for infertility issue thus couples with infertility problems should prepare a lot of money for treatment. It is very important to know the success rate of combination of SRS and ICSI in Cipto National Hospital as reference for other center, thus patients could calculate their cost and effectiveness of the treatment.

2. Experimental Details

This is a retrospective study based on secondary data collected from male infertility database in Department of Urology, Cipto Mangunkusumo National Hospital. Database were consist of patients with chief complain of infertility that coming to urology outpatient ward in Cipto Mangunkusumo Hospital from 2005 to 2015. The diagnosis was concluded based on history taking, physical examination, and supporting examination. Only patients who underwent successful sperm retrieval surgery (PESA/TESE) and Intra Cytoplasmic Sperm Injection for their spouse were included in this study. Age of patients and wife, duration of marriage, type of infertility, type of sperm retrieval surgery, sperm analysis, occurrence of varicocele, underlying diseases, patients' FSH level, and wife's β hCG level were recorded.

This study outcomes are the present of pregnancy and the successful event of laboring. The pregnancy and labor status are classified based on spouse's β hCG level during initiation of ICSI. β hCG is considered low if the level below 50 mIU/mL. The results are noted whether the spouse became pregnant, miscarriage, or already gave birth. If the results are not yet recorded, patients were interviewed via telephone. Patients were excluded from the study in they can't be contacted. All data were then collected in software, SPSS ver [20].

3. Results and Discussion

3.1. Results

There were 123 patients underwent SRS and the sperm were found in more than 95.5% but 18.7% them could not be used for ICSI programs. From 123 patients, unfortunately 5 patients (4.1%) could not be contacted and there were no data from the infertility database. These patients were categorized as "lost to follow up". The rest 23 patients (18.7%) did not have viable sperm after SRS procedure and did not proceed to ICSI while 29 of patients (23.6%) did not proceed to ICSI and decided to store the sperm for later use. There were 66 patients had viable sperm and underwent ICSI procedure. Unfortunately, from these 66 patients only 40 that could be contacted with average

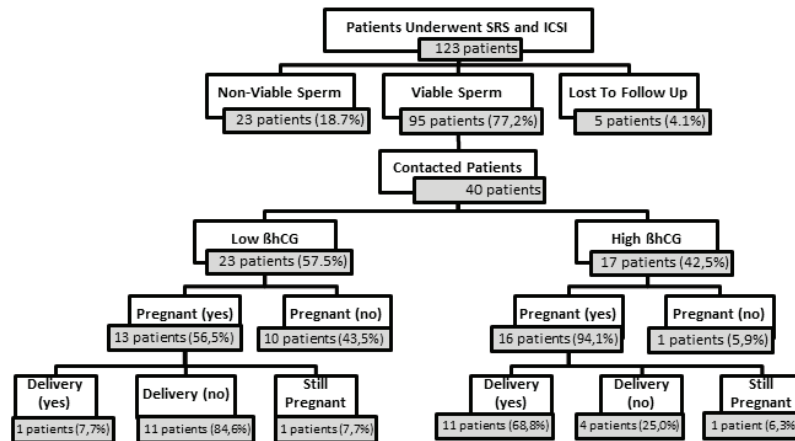


Figure 1: Results of SRS and ICSI (Intra Cytoplasmic Sperm Injection) Programs Based on β hCG Levels after Initiation of Therapy. (SRS = Sperm Retrieval Surgery; ICSI = Intra Cytoplasmic Sperm Injection).

	N (%)
Age (years old)	
Patients	40.3 ± 8.2
Wife	33.2 ± 5.1
Duration of Marriage (years)	7.6 ± 4.6
Type of Infertility	
Primary	32 ??
Secondary	17.5%
Sperms Retrieval Surgery	
PESA	55.0%
TESE	32.5%
MESA	12.5%

TABLE 1: Patients Characteristics, n = 40.

age of husband, wife, and duration of marriage were 40.3 + 8.2, 33.2 + 5.1, 7.6 + 4.6 years old respectively. Most of patients were suffered from primary infertility. From 40 patients that underwent ICSI the sperm were collected from PESA (55.0%), TESE (32.5%), and followed by MESA (12.5%) (Figure 1). Further patients' characteristics can be seen in Table 1.

Varicoceles were found in more than 40% of patients. Most of patient did not have any concomitant disease related to infertility issues, but there were 5% of patients suffered from agenesis of vas deferens while 7.5% of patients had underwent vasectomy procedure. From Sperm analysis, more than 90% of patients were suffered from azoospermia (Table 2).

In general, the pregnancy rate from patients who underwent SRS and ICSI procedures was 72.5%. We then analyzed the success rate of pregnancy and labor status.

	N	%
Sperm Analysis		
Azoospermia	37	92.5
Cryptozoospermia	1	2.5%
Oligospermia	1	2.5%
Oligoasthenoteratozoospermia	1	2.5%
Varicocele		
Yes	17	42.5%
No	21	52.5%
No Data	2	5.0%
Concomitant Disease		
Agenesis Vas Deferens	2	5.0%
Hydrocele	1	2.5%
Post Vasectomy	3	7.5%
Spermatocele	1	2.5%
No Disease	33	82.5%
Patients' FSH Level		
Normal	30	75.0%
High	6	15.0%
No Data	4	10.0%
Wife's βhCG		
Low	23	57.5%
High	17	42.5%

TABLE 2: Sperm Analysis, Concomitant Disease, and Hormonal Level (n=40) (FSH=; bHc).

From 23 patients that had low β hCG level there were 13 patients (56.5%) become pregnant. Unfortunately, only 1 patient (7.7%) had successful laboring while most of them (84.6%) experienced miscarriage. In the high β hCG group (17 patients), almost all of them experienced pregnancy with just 1 of them failed to get pregnant. From these 17 successful pregnancies, 11 (68.8%) patients also experienced successful laboring with just 4 (25.0%) of them experienced miscarriage. From both group, there were 1 patient in each group that were still pregnant during the study.

4. Discussion

Nowadays, couples with infertility issues can be help by artificial reproductive technology (ART). One of modalities in ART is intracytoplasmic sperm injection (ICSI). ICSI itself is defined as an assisted reproduction approach by injecting sperm into an oocyte [10]. ICSI is a preferred approach in male patients with low sperm concentration, low

sperm motility, high abnormality of sperm morphology, or even in patient without any ejaculated sperm [10]. Now a days, only a single spermatozoon and one oocyte is needed in order to achieve pregnancy through ICSI procedure [11].

However, in order to get appropriate sperm to be injected into oocyte, a sperm retrieval surgery (SRS) is needed to be performed by an urologist. A well-known SRS are percutaneous epididymal sperm aspiration (PESA), microsurgical epididymal sperm aspiration (MESA), and testicular sperm extraction (TESE) [9].

A vital sperm is needed for ICSI procedure; in this research we determined the vital sperm by observing its motility. In this research, only motile sperm were used for ICSI procedure. Non-motile sperm were considered as dead spermatozoa. Dead spermatozoa have disruption of membrane integrity which could lead to DNA damage [11].

In this study, the average age of patients was 40.3 ± 8.2 years old and 33.2 ± 5.1 years old for their spouse. These results are similar with a study done by Osmanagaoglu in which the average age of patients was 39.3 years old while the spouse average age was 32.3 years old [12]. In our study, from the SRS procedure, sperm could be found in almost all of patients (95.5%). However, only 76.8% of them had motile sperm that could be used for ICSI procedure. Our successes in retrieving sperm from SRS procedure were higher compared with other study. A study done in 2004 showed that success rate in retrieving sperm from SRS procedure were around 80-90% [13]. Other study even showed lower success rate in retrieving sperm from SRS procedure which just around 40.5% to 48.3% of sperm retrieved [14,15]. However, our study had lower results if compared with a study done by Esteves et al (95.5% vs 96.8%) [16].

In general, this study had success rate of pregnancy more than 70%. Our results was higher with other studies (72.5% vs 31.6% vs 42.9% vs 20%) [11,14,17]. In our study, we classified pregnancy and success rate of delivery base on β hCG level in the early of ICSI procedure. There were 57.5% and 42.5% of patients in low β hCG and high β hCG level respectively. The pregnancy rate were quite difference, which were significantly higher in high β hCG level group (56.5% vs 94.1%). A study done by Noorhasan et al showed that early β hCG is not correlated with the occurrence of clinical pregnancy [18].

In overall, our study resulted in successful delivery rates of 30%. Our result was higher compared with other studies (30% vs 22.3% vs 13.4%) [11,15]. However, our study result in lower rate of successful delivery if compared with other studies (30% vs 50% vs 34.4%) [10,16]. In stratified group based on β hCG level, higher β hCG group had higher rate of successful delivery rates. In low β hCG level group, from 13 pregnant women, only 1 (7.7%) patient had successful delivery. In another hand, from 16 patients in high β hCG level group, 11 (68.8%) patients had successful delivery. The results could be higher or even lower since there was 1 patient in each group still waiting for delivery date during the interview.

5. Conclusion

Sperm retrieval surgery such as PESA/TESE is the best approach to gain sperm in obstructive azoospermia patient. The success rate of pregnancy after PESA/TESE and ICSI is high with one third of patients have succeed in giving birth.

References

- [1] A. Mendeleev, Definitions Of Infertility And Recurrent Pregnancy Loss: A Committee Opinion, *Fertil Steril*, **99**, no. 1, p. 63, (2013).
- [2] S. O. Rutstein and I. H. Shah, Infertility, And Childlessness In Developing Countries, *DHS Comparative Reports 9. DHS Comp Reports*, **9**, 13-50, (2004).
- [3] T. Bushnik, J. L. Cook, A. A. Yuzpe, S. Tough, and J. Collins, Estimating the prevalence of infertility in Canada, *Human Reproduction*, **27**, no. 3, 738-746, (2012).
- [4] O. S. Philippov, A. A. Radionchenko, V. P. Bolotova, N. I. Voronovskaya, and T. V. Potemkina, Estimation of the prevalence and causes of infertility in Western Siberia, *Bulletin of the World Health Organization*, **76**, no. 2, 183-187, (1998).
- [5] Y. Che and J. Cleland, Infertility in Shanghai: Prevalence, treatment seeking and impact, *Journal of Obstetrics and Gynaecology*, **22**, no. 6, 643-648, (2002).
- [6] M. G. R. Hull, C. M. A. Glazener, N. J. Kelly, D. I. Conway, P. A. Foster, R. A. Hinton, C. Coulson, P. A. Lambert, E. M. Watt, and K. M. Desai, Population study of causes, treatment, and outcome of infertility, *British Medical Journal*, **291**, no. 6510, 1693-1697, (1985).
- [7] P. C. Steptoe and R. G. Edwards, Birth after the reimplantation of a human embryo, *Archives of Pathology and Laboratory Medicine*, **116**, no. 4, p. 321, (1992).
- [8] G. Palermo, H. Joris, P. Devroey, and A. C. Van Steirteghem, Pregnancies after intracytoplasmic injection of single spermatozoon into an oocyte, *The Lancet*, **340**, no. 8810, 17-18, (1992).
- [9] T. Practice and R. Medicine, Sperm Retrieval For Obstructive Azoospermia, *Fertil Steril [Internet]*, *American Society For Reproductive Medicine*, **90(5 suppl.)**, 213-8, (2008)., Available from: <http://dx.doi.org/10.1016/J.Fertnstert.2008.08.047>.
- [10] B. Hollingsworth, A. Harris, and D. Mortimer, The cost effectiveness of intracytoplasmic sperm injection (ICSI), *Journal of Assisted Reproduction and Genetics*, **24**, no. 12, 571-577, (2007).
- [11] T. Stalf, H.-C. Schuppe, R. Henkel, W. Weidner, W.-B. Schill, H.-R. Tinneberg, and H. Gips, Limitations for ICSI, MESA, TESE? - experiences from the IVF centre in Giessen., *Andrologia*, **35**, no. 3, 181-183, (2003).
- [12] K. Osmanagaoglu, V. Vernaev, E. Kolibianakis, H. Tournaye, M. Camus, A. Van Steirteghem, and P. Devroey, Cumulative delivery rates after ICSI treatment cycles with freshly retrieved testicular sperm: A 7-year follow-up study, *Human Reproduction*, **18**, no. 9, 1836-1840, (2003).

- [13] S. K. H. Ashour and P. S. R. Murthy, Testicular sperm retrieval for assisted reproductive techniques, *Reviews in Gynaecological Practice*, **4**, no. 2, 105–110, (2004).
- [14] S. Kahraman, S. Özgür, C. Alataş, S. Aksoy, M. Taşdemir, A. Nuhoğlu, I. Taşdemir, B. Balaban, K. Biberoglu, R. Schoysman, M. Nijs, and P. Vanderzwalmen, Fertility with testicular sperm extraction and intracytoplasmic sperm injection in non-obstructive azoospermic men, *Human Reproduction*, **11**, no. 4, 756–760, (1996).
- [15] V. Vloeberghs, G. Verheyen, P. Haentjens, A. Goossens, N. P. Polyzos, and H. Tournaye, How successful is TESE-ICSI in couples with non-obstructive azoospermia? *Human Reproduction*, **30**, no. 8, 1790–1796, (2015).
- [16] S. C. Esteves, Percutaneous epididymal sperm aspiration as a method for sperm retrieval in men with obstructive azoospermia seeking fertility: Operative and laboratory aspects, *International Braz J Urol*, **41**, no. 4, p. 817, (2015).
- [17] P. Devroey, J. Liu, Z. Nagy, A. Goossens, H. Tournaye, M. Camus, A. Van Steirteghem, and S. Silber, Pregnancies after testicular sperm extraction and intracytoplasmic sperm injection in non-obstructive azoospermia, *Human Reproduction*, **10**, no. 6, 1457–1460, (1995).
- [18] DJ. Noorhasan, PG. MCGovern, M. Cho, A. Seungdamrong, K. Ahmad, and DH. McCulloh, Serum Hcg Levels Following The Ovulatory Injection: Associations With Patient Weight And Implantation Time, *Obstet Gynecol Int [Internet]*, **2015**, no. 1, (2015)., Article ID 520714.