



ORIGINAL RESEARCH PAPER

Anaesthesiology

COMPARISON OF SPINAL ANAESTHESIA (SUB ARACHNOID BLOCK) AND INTRA VENOUS GENERAL ANAESTHESIA FOR THE PATIENTS UNDERGOING ULTRASOUND GUIDED OOCYTE RETRIEVAL –A PROSPECTIVE STUDY

KEY WORDS: Spinal Anaesthesia, Intravenous General Anesthesia, Oocyte Retrieval

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ABSTRACT

Aim: To compare two different anaesthetic techniques in view of assessing effective pain relief, stress level during intraoperative and postoperative period in patients undergoing Oocyte retrieval procedure.

Materials and methods: This comparative study included 60 patients. Patients were divided into two groups. Those in Group-S patients were given Sub Arachnoid Block(SAB) using 1.5 ml 0.5% Hyperbaric Bupivacaine at L₃-L₄ or L₄-L₅ interspace (With aim of blockade at level of L1 spinal segment distribution) and Group-G patients received intravenous general anesthesia with Glycopyrrolate (20 µg/kg), Inj. Midazolam 1-2 mg IV, Inj. Fentanyl (2 µg/kg), and Ketamine (1mg/kg)

Results: Patients received Spinal Anaesthesia -Sub Arachnoid Block (Group S) had stable intra procedure haemodynamic status, comfortable intra operative positioning of the patients and the consumption of demand analgesia was less which was statistically significant and had few post procedure side effects (statistically significant) in comparison with Group G who had variable haemodynamic status , more post procedure PONV, anxiety and the need for demand analgesia was also more.

Conclusion: Our study showed that Oocyte retrieval done under Spinal anaesthesia had excellent intra procedure haemodynamic stability and comfortable post procedure status and fewer side effects than patients received intravenous general anesthesia .

Introduction

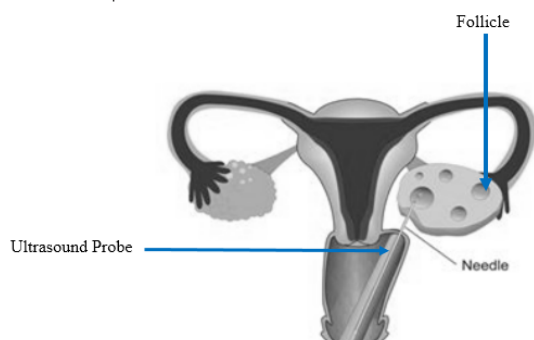
In vitro fertilization (IVF) is one of the most important and end point of infertility treatment and Oocyte retrieval is one of the important step of IVF .This procedure requires picking up the mature oocytes from the ovaries of infertile patients and also from women who are coming forward as Oocyte donors. These oocytes are fertilized in vitro immediately or after freezing to be utilized in a later date and allowed to develop as various stages of embryo under monitoring and good ones are transferred into the uterus . Different strategies are adopted to make the procedure as comfortable and safe for the patient. Controlling the pain during the procedure is main important goal , not only to make the patient comfortable but also to facilitate the process of follicular puncture through ovarian tissues and decrease the chance of injury to adjacent structures especially to the blood vessels. Patients undergoing in vitro fertilization may be exposed to various techniques of anesthesia ranging from general anesthesia, spinal anesthesia , conscious sedation, injection of local anesthetic agents into the cervix or the vaginal wall (paracervical block)^{1,2}. A good anesthetic technique should be comfortable for both the patient and obstetrician with minimal side effects , short recovery time should have least or no impact on the quality of oocyte and its growth as embryo. Intravenous general anesthesia and conscious sedation are commonly practiced form of pain control for trans vaginal oocyte retrieval in IVF procedure.^{3,4,5}

The standard regimen for IVF in our practice has been either intravenous general anesthesia with ketamine or spinal anaesthesia depending on patient consent, number of mature follicles, co-morbid illness and anaesthesiologist comfort.

Materials and methods

After obtaining written informed consent from the patients, were included in this study. The patients were of American Society of Anesthesiologist (ASA) physical status I & II and age between 25 and 35 years and posted for ultrasound-guided oocyte retrieval using the trans vaginal technique. After securing the IV line with 20-gauge Venflon on the right hand Ringer's Lactate solution was started. Patients were randomly divided in 2 groups(30 subjects per group) according to the anesthetic regimen. Those in Group-S patients were given SAB using 1.5 ml 0.5% hyperbaric Bupivacaine at L₃-L₄ or L₄-L₅ interspace and sedated with Inj. Midazolam 1-2 mg and Group-G patients received intravenous general anesthesia with Glycopyrrolate (20 µg /kg), Inj. Midazolam 1-2 mg IV, Inj. Fentanyl (2 µg/kg), and Ketamine (1mg/kg). Ketamine was repeated with 0.25 mgms/Kg when required.

After Ovulation induction as per the protocol with a gonadotropin releasing hormone antagonist and a recombinant follicle-stimulating hormone (FSH). Human chorionic gonadotropin (HCG) was administered 34-36 hrs prior to oocyte retrieval. The oocyte retrieval procedure was carried out through trans vaginal technique.



Transvaginal Oocyte Retrieval

Anesthetic agents have different effects on oocyte fertilization and embryonic development. Nitrous oxide,midazolam, fentanyl, alfentanil, and lidocaine in a human study and isoflurane in an animal study have been reported in follicular fluid. Vincent et al. found that propofol was associated with lower clinical and ongoing pregnancy rates when compared to isoflurane.^{6,7,8}

In the operating room, basic physiological monitoring was connected . Electrocardiogram (ECG),Non Invasive Blood Pressure (systolic, diastolic, and mean blood pressure), Heart Rate (HR), and Pulse Oximeter. Transvaginal oocyte retrieval was performed with ultrasound (Vaginal Probe with Needle Guide) guided using a 17-gauge needle. The needle was introduced into a follicle through uppermost part of the lateral vaginal wall with suction of 100-150 mmHg until the follicle was emptied. Each visible follicle was emptied by this same method.The total number of needle insertion through lateral wall of vagina and ovarian surface varies from patient to patient depend on the positioning of the ovary and its mobility. The total duration was calculated for the procedure was defined as the span of time from the initial placement of the vaginal ultrasound probe until its removal at the end of the procedure. Patients in both groups were attended by the same surgeon and anesthesiologist and same team of paramedical staff.

Conscious sedation is widely accepted for the short-term

management of pain .It is a technique in which the use of a drug or drugs produces a state of depression of the central nervous system enabling treatment to be carried out, but during which verbal contact with the patient is maintained throughout the period of sedation and the procedure can be conveniently performed as day care. This remains the most commonly used method of providing analgesia and anaesthesia during trans vaginal oocyte retrieval

Results

Out of 60 patients who were part of this study 30 of whom received Sub Arachnoid Block(SAB) (Spinal) and 30 of whom received intravenous general anesthesia. There were no significant differences between the groups with regard to patients physical characteristics and procedure (surgical) time.

Table-1 Patient Physical Parameters and Procedure Time

Physical Parameters	n=30 in each Group	
	Group S	Group G
Age	29.4 ± 4.6	29.8 ± 4.2
Height (cms)	162.4 ± 4.5	163.2 ± 3.8
Weight (kgs)	55.4 ± 6.5	54.9 ± 6.9
BMI	22.6 ± 1.5	22.2 ± 1.8
Procedure Time (minutes)	45.6 ± 10.3	44.9 ± 11.1

Pre operative preparatory guidelines like receiving the patients in the pre op room, securing intra venous access, checking the vital parameters and confirming the identity by basic questions and reassuring them about the procedure and out come of the procedure were similar for the both groups.

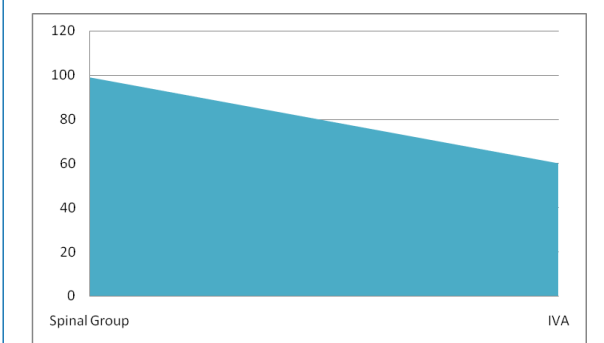
They had similar baseline systolic blood pressure (SBP), diastolic blood pressure (DBP), mean blood pressure (MBP), and HR. In an inter group comparison, all hemodynamic parameters (SBP, DBP,MBP, and HR) were significantly lower in Group S when compared to Group G. The comparison showed that SBP, DBP, MBP, and HR were significantly decreased in Group S at all measurement points when compared to baseline values.

Table-2 Intraoperative Monitoring Parameters in both treatment group.

Variables	Base Line	Group S	Group G
Hear Rate	78.4 ± 6.2	71.4 ± 5.2	84.3 ± 6.3
Systolic BP(SBP)	115 ± 4.5	106.5 ± 5.2	123.3 ± 6.2
Diastolic BP (DBP)	70.5 ± 3.8	64.6 ± 6.4	78.3 ± 7.1
Mean Arterial Pressure (MAP)	90.2 ± 2.6	78.6 ± 5.8	93.3 ± 6.5

Patient Satisfaction and Quality of recovery were measured by using the parameters like Pain, PONV(Post operative Nausea and Vomiting), Anxiety and Depression and Cognitive recovery during pre-operative preparation, and 30 and 90 minutes after end of procedure.

Patient Satisfaction Rate

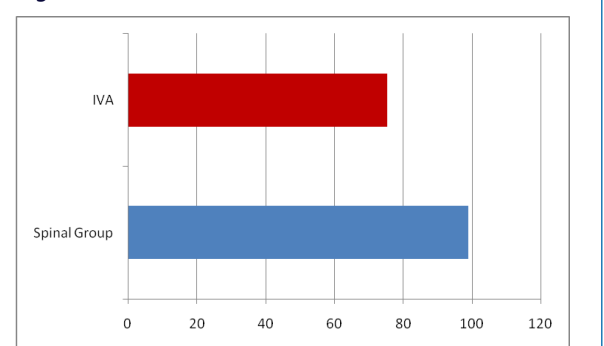


The total amount of Ketamine was 100±25 mg and the total amount of fentanyl was 100±20 µg in intra venous general anesthesia group. The recovery time was 3 or 5 minutes for most of the patients in this group, The mean recovery time of patients in

the general anesthesia group was 4 minutes. In Spinal-Sub Arachnoid Block(SAB) Group the recovery from sedation was immediate except for the persistent Motor and Sensory block of the Lower Limbs for the period of 60 ±15 minutes after the procedure

The surgeon satisfaction rate was significant with 98.9 % of the patients in Group S (Spinal Group) and 75.3% in Group G .

Surgeon Satisfaction Rate (%)



Discussion

Oocytes retrieval from the ovary is one of the basic step of IVF treatment. Trans vaginal oocyte retrieval may be the painful procedure performed during IVF treatment though less invasive than the laparoscopic approach

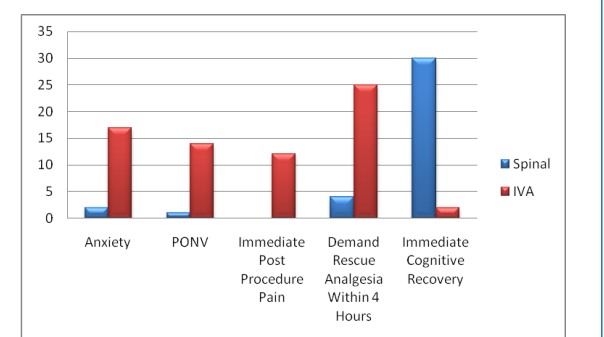
In this prospective study of 2 alternatives for pain control during oocyte retrieval, we found that procedure done under Sub arachinoid block was well accepted by the patients and with excellent surgeon satisfaction rate.

The pain associated with oocyte retrieval is intermittent rather than continuous. An ideal technique of pain relief is one which has the flexibility to respond to the changing requirements of women undergoing oocyte recovery. The following types of pain relief techniques are used for transvaginal oocyte retrieval including conscious sedation and local para cervical block, spinal and general anaesthesia. The primary goal is to provide safe and effective analgesia facilitating optimum surgical conditions and speedy post-operative recovery with less side effects.

As expected, intra operative hemodynamic data were lower in the Spinal anesthesia group and recovery time was instantaneous min for most patients in this group and more importantly provide adequate levels of analgesia during the puncture of the vaginal wall.

The results of general anesthesia using inhalation agents, nitrous oxide, intravenous agents,Ketamine (especially propofol), and opioid analgesics for oocyte retrieval are controversial in assisted reproduction techniques.

Post Procedure Patient Evaluation



As far as the Intra operative and Post operative Surgeon and Patient satisfaction level is concerned, Sub Arachnoid Block(SAB) is being an excellent choice of anaesthesia except in patients with

contraindications for spinal sub archinoid block like post lumbo sacral spinal surgery, skin infection at the site the needle insertion, technical difficulty to perform SAB and in patients with cardiac disease and more importantly patient's unwillingness but excellent choice in patients with COPD.

Conclusion

We conclude that Spinal (Sub Arachnoid Block) with level of blockade at L1 level provides comfortable intra operative positioning of the patients and haemodynamic stability and events free post operative outcome with incomparable satisfaction for both the surgeons and the patients and may be considered as a suitable technique of choice for Ultrasound guided Oocyte Retrieval procedure in patients undergoing IVF treatment .

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