ORIGINAL ARTICLE

Comparison of General Anesthesia with Epidural Anesthesia for Renal Transplant

ANEEL ASLAM[1], ADEEL ASLAM[2], SHIRJEEL CHAUDHRY[3], *ABDUL QAYYUM[4]*

ABSTRACT

Aim: To compare Epidural Anesthesia with General Anesthesia for renal transplant surgery, by comparing changes in Blood pressure, Electrocardiogram, and Arterial Blood Gases.
Method: This comparative study was carried out at Armed Forces Institute of Urology Rawalpindi from January 2008 to January 2009. A total of 60 patients were studied in 2 different groups Group A and Group B. Group A 30 patients were given epidural anesthesia whereas Group B 30 patients were given general anesthesia. Recipient ASAIII grade patients were selected. And patients having Hb less than 8g/dl, Hepatitis B/C and HIV positive, ejection fraction less than 0.25, and deranged LFT's or with coagulopathies were excluded.
Results: Group A patients showed better control on Blood pressure, Arterial Blood Gases, Central venous pressure, Urine output, ECG and Pulse Oximetry.
Conclusion: Epidural anesthesia is a more balanced anesthetic technique than General anesthesia for Renal Transplant Surgery.
Keywords: Epidural anesthesia, CVP (central venous pressure), ABGs (Arterial blood gases)

INTRODUCTION

Renal Transplant previously an uncommonly performed surgery and with a poor outcome has now become a frequently undertaken procedure in most of the leading hospitals, along with an encouraging outcome and thus giving the patient a new hope of dialysis free healthy life.

Anesthetists undertake the challenge of this major operation have practiced both epidural and general anesthesia. Epidural anesthesia is considered to be safer modality to provide analgesia and anesthesia, but still anesthetists are reluctant to use this anesthetic technique in renal transplant. Both types of anesthesia have their own merits and demerits, but as a whole epidural anesthesia will out date the traditional General Anesthesia for renal transplant in coming days.

MATERIAL AND METHODS

A comparative study was conducted between general anesthesia and epidural anesthesia for renal transplant from 2008 January to 2009 January after taking permission from ethical committee of AFIU (Armed Forces Institute of Urology). Two groups (Group A and Group B) having 30 patients each were formed. Group A, represents patients in whom were given epidural anesthesia, and Group B, represent patients in whom general anesthesia was given. Consent from patient and also from surgeon was taken as some surgeons have reservations for epidural. All the donors were given General Anesthesia. The patients were of age 35-55years. They were on antihypertensive therapy, which was converted to intravenous antihypertensive drugs two days prior to surgery. Patients were of ASAIII group, all were hemodialysed before surgery, Central Venous Pressure line (CVP) was passed and maintained at 4-5cm of water preoperatively ECG was taken preoperatively. ABGs were done pre-operatively and base deficit was corrected. Anemia was corrected pre-operatively up to 8g/dl. Hyponatremia, hypocalcaemia, hyperkalemia and hyperphosphatemia were improved pre-operatively. All patients having Hb less than 8g/dl, Hepatitis B/C positive, Ejection fraction less than 0.25, HIV positive, and deranged LFT's or with coagulopathies were excluded.

Group A patients were given epidural analgesia with 0.5% bupavicain plain 14-17ml at L-2 level. Loss of resistance technique was used to locate epidural space and epidural catheter was passed. All patients were sedated with 2mg dormicum. Epidural top up was given with 0.5% bupavicain plain 10ml. In group B all patients were induced with 6-8% sevoflurain, intubated with atracurium 40-50mg, maintained on 100% oxygen and 1% sevoflurain. No nitrous was used and 6-8mg Nubian was given intra-operatively.

In both groups intra-operative monitoring continued every 5 minutes. We monitored blood pressure (noninvasive), ECG, capnography, pulse

[1]*Senior Classified Anesthetist, AFIU Rawalpindi*
[2]*Assistant Professor of Anesthesia, Children Complex, Multan,*
[3]*House Officer, Anesthesia, PIMS Islamabad*
[4]*Professor of Anaesthesia, Shalamar Medical College, Lahore*
Correspondence to Dr. Aneel Aslam

oximetry, cvp, fluid intake/output, urine output. ABGs were done pre-operatively, intra-operatively, just before clamping the vessels, after removing the clamp and post-operatively. In both the groups normal saline was used as intra-venous fluid, both groups of the patients were given lasix 2-3mg per kg when the donor kidney has been transplanted just after removing the clamps. Mannitol 20 percent 5ml per kg body weight was also started after the lasix injection.

Postoperatively patients were shifted to Intensive Care Unit where ECG, blood pressure, pulse oximetry, capnography, CVP, intake fluid, output of urine and ABGs were monitored.

RESULTS

All patients data was assessed as per SPSS 17 Mean BP and PH in relation to Time were plotted. All patients were monitored, intra-operatively with Blood Pressure, Central Venous Pressure, pulse-oximetry, capnography, ECG, urine output and ABGs. The recording of a Blood Pressure in Group B shown in figure 1 shows that there is an initial fall in BP (mean) in first few minutes due to induction with Sevoflurane then there is a sudden rise due to intubation and then there is fluctuating BP (mean) curve due to fluctuating ABGs, again there is a sharp rise in BP at extubation this clearly indicates haemodynamic instability. In comparison the group A patients figure 2 shows fall of BP after ten minutes and then there is gradual rise of BP without any fall of BP at later stage. Secondly the fall of BP in-group B patients initially is more as seen in-group A patients. ABGs (PH in relation to time) as shown in figure 3, 4, remained more stable with group A as compare to General Anesthesia group that is B as group A showed flate graph. *CVP* in group A patients remained 4-6 cm of water whereas in group B CVP remained between 6-15 cm of water. Which shows that in group A CVP remained stable, showing fewer variations in cardiac status. ECG monitoring shows sinus tachycardia after intubation in group B. 5% patients also developed VPC (ventricular premature contractions) at intubation Dysrhythmias were observed in 5% patients at extubation. In comparison group A showed none. Capnography remained more stable with epidural patients. *Urine output* was between 12-15 liters/24hrs in group A and 10-12 liters/24hrs in group B. *s Pulse oximetry* was 100% at fiO_2 1 in group B and 98-100% in group A at fiO_2 0.4.

Figure 1

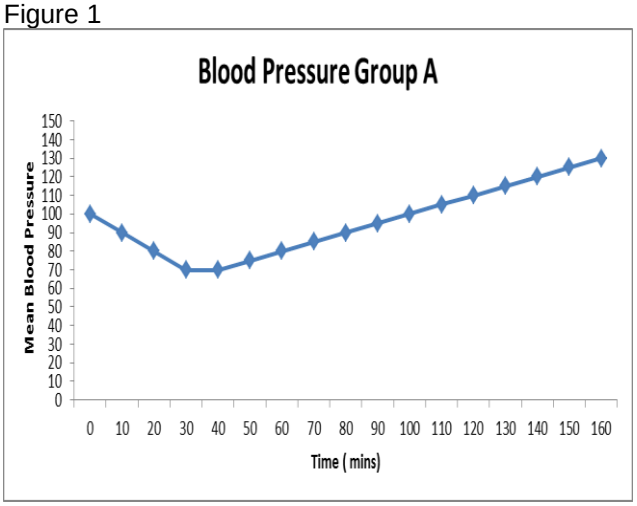


Figure 2

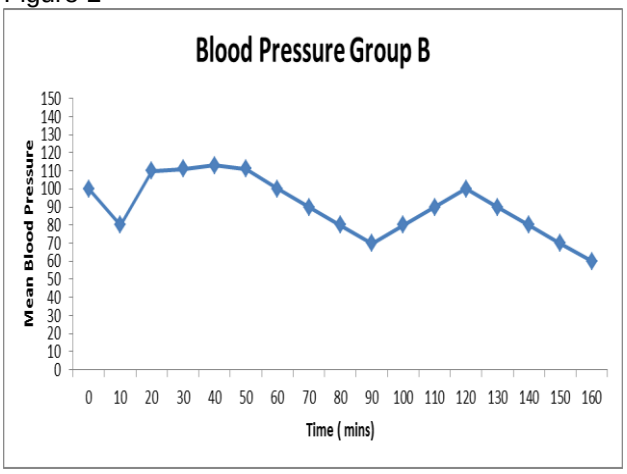


Figure-3

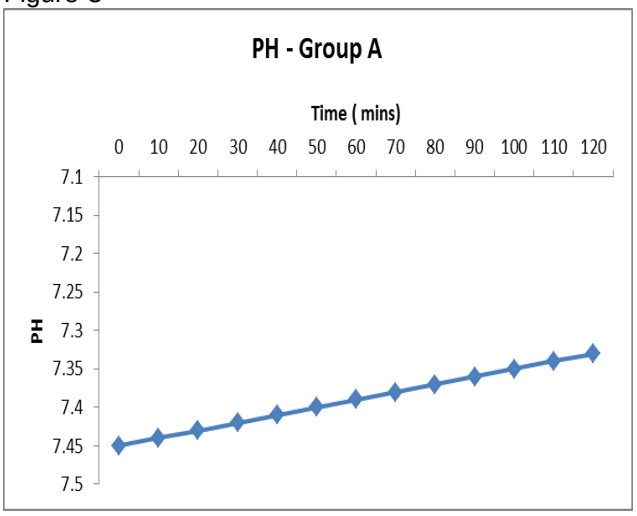
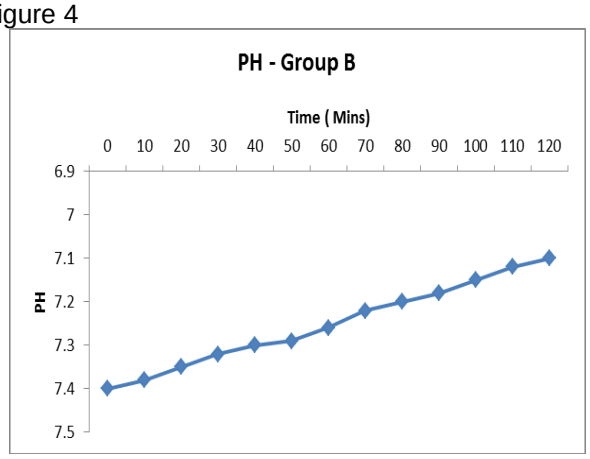


Figure 4



DISCUSSION

Anemia in CRF patients can lead to tissue hypoxia which is further aggravated in GA due to V/Q mismatch[1]. Chronic renal failure associated with hypoxia can lead to CCF. In both of our groups A and B no hypoxia was noted[2].

The CRF patients have hypertension and they are on antihypertensive therapy, which is stopped a day or two before surgery and placed on IV antihypertensive therapy. As higher blood pressure is required for the transplanted kidneys perfusion so we have to stop the IV antihypertensive therapy on the day of surgery. With this the risk of MI, CCF, Pulmonary Edema and cerebral Edema increases as they are already more susceptible to these problems due to uremia[3]**.** The risk increases with endotracheal intubation and extubation. In group B patients fluctuating blood pressure with fall at Induction and rise at Intubation and Extubation were noted but not seen in group A these haemodynamic changes puts patients at risk of MI, CCF, Pulmonary oedema, Dysrythmias were also observed in 5 percent cases of group B[4].

Chest infection chronic bronchitis, pneumonias, pleural effusion and pulmonary edema risk is reduced with epidural analgesia In group A no such complications observed but 1 percent patients developed pleural effusion and pneumonias in group B.

Encephalopathy seen in uremic patients is due to nitrogenous products, guanithidine, creatnine and uremia. Many things have been implicated but it is known fact that hypertension specially occurring at the time of intubation and extubation can aggravate the conditions. 1 percent patients developed cerebral oedema in group B[5]**.**

Intubation and extubation with general anesthesia can have complications tachycardia, dysrraythmias hypertension, hypoxemia, pulmonary edema; all these problems are no more seen with epidural analgesia. 5 percent of cases dysrrythmias were observed at time of intubaion and extubation in group B[6].

Coagulopathy patients with CRF have a tendency for excessive bleeding in the perioperative period. The risks of bleeding complications should be considered when deciding to use regional anesthetic techniques in CRF[7].

Fluid and electrolyte problem like Hyponatremia, hypocalcaemia, Hyperkalemia hyperphosphatemia, hypomagnesaemia, and metabolic acidosis, are corrected pre-operatively. Intra-operatively use of bicarbonate corrected metabolic acidosis in a better way in spontaneously ventilating patients of group A on epidural than in group B. The hyperkalemia and Hyponatremia are also corrected with bicarbonate infusions in better way in group A without any hypercapnia[8]**.**

Renal dystrophy leading to fractures includes cervical vertebra or neck of mandible while intubation was minimized with epidural anesthesia group A[9].

Post-operative analgesia is managed with epidural analgesia in more effective way and without any residual effects of narcotic analgesics so group A was found to be better

CONCLUSION

Epidural anesthesia is a more balanced anesthetic technique than General anesthesia for Renal Transplant Surgery.

REFERENCE

1. Anesthesia for patients with Renal Failure. (2006). 4, 32-749.
2. The Seventh Report of the Joint National Committee on Prevention Detection Evaluation and Treatment of High Blood Pressure. (2006). The JNC 7 Report.
3. Ashton, R. W., Burkle, C. M., & Ashton, R. W. (n.d.). Endotracheal Intubation by Direct Laryngoscopy.
4. Bucurescu, G. (2008). Uremic Encephalopathy. 1-35.
5. D. M., & Milner, D. (2004). Chronic renal failure and anesthesia. 4(18), 1-30.
6. ken, T. (2001). fluid replacement therapy, Management of water and electrolyte disorder in chronic renal failure. *Clinic All-round,* 50(11), 3024-3029 .
7. Morgan, G., Murray, M. J., & Mikhail, M. S. (2006). Anesthesia for patients with Renal Disease. *4*, 32-745.
8. Silverberga, D., W. D., B. B., & A. I. (2003). Anemia in Chronic Kidney Disease and Congestive Heart Failure. *Karger Medical and scientific publishers, 21*(1), 1-75.
9. Stewart, D. P., & Harris, D. (2000). *3*(11), 1-20.