**Intravenous Dexmedetomidine Infusion In Adult Patients Undergoing Open** **Nephrolithotomy: Effects On Intraoperative Hemodynamics And Blood loss.**

**Clinical research study**

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**Introduction:**

Dexmedetomidine (DEX), an \_α-2 agonist with sedative,

sympatholytic, and analgesic properties (1)

Stimulation of alpha2-adrenoceptors may determine pro and anti-platelet aggregation effects through direct and indirect mechanisms Dexmedetomidine pro and anti-platelet aggregation mechanisms interaction determines mild hypocoagulation, however maintaining coagulation within normal ranges (2).

Platelets bear alpha 2-receptors on the cell surface. Stimulation of these receptors by agonists induces platelet aggregation in vitro dexmedetomidine did not alter platelet aggregation or alpha 2-receptor density but did not change alpha 2-receptor density. It was shown that desensitization of platelet aggregation can occur without quantitative changes in alpha 2-receptors. (3)

Dexmedetomidine at concentration between 1 ‐ 5 ng/ml had minimal effect on the platlet aggregation. Nonetheless, higher concentration of dexmedetomidine (50 and 500 ng/ml) could potentiate ADP‐induced loose platelet aggregation to form the firm aggregates. (4)

The decision to administer blood products is complex and multi-factorial. Accurate assessment of the concentration of hemoglobin is a key component of this evaluation. (5)

The specific “transfusion trigger” that is the threshold for administering packed red blood cells or whole blood has been debated for years. (6,7,8)

In a hypovolemic patient, a Hb level of 10 g/dL may indicate the need for a blood transfusion, whereas for all patients a level of 7.0 g/dL generally indicates the need for transfusion.(9)

We hypothesized that intravenous infusion of dexmedetomidine in adult patients undergoing open nephrolithotomy under general anesthesia may provide better intraoperative hemodynamics hence reducing bleeding and blood transfusion.

The aim of this prospective randomized double blinded controlled study is to evaluate the effect of intravenous dexmedetomidine infusion on intraoperative hemodynamics and blood loss in adult patients undergoing opennephrolithotomyunder general anesthesia.

**Patients and Methods:**

After approval of the ethical committee in Benisuef university hospitals (Egypt), a written informed consent will be obtained from 50 ASAI and II males and females patients aged 20-60 years old, planned for elective open nephrolithotomy under general anesthesia

Patients will be excluded if they ASA more than II , had a known cardiac arrhythmias ,significant liver disease defined as (serum alanine aminotransferase and serum aspartate aminotransferase >2.5 times normal),significant renal disease defined as (serum creatinine >1.5 mg/dl or creatinine clearance <40 ml/min),pregnant patient, significant coagulopathy defined as (INR >1.5),use of antiplatlets or anticoagulants ,anemic patients with Hb% less than 10 gm/dl

 In the operating room, a intravenous cannula will be inserted and 8 ml/kg Ringer solution will be infused. Electrocardiogram pulse oximetry, non-invasive arterial blood pressure at 5 minutes intervals and BIS monitor strip (BIS Sensor®; Aspect Medical Systems, USA, Toll free 1-888-BIS Index) applied to the forehead before induction of anesthesia will be applied.

The study drugs will be prepared by a senior anesthetia resident unaware of the study protocol

Patients will randomly allocated using a closed envelop technique into two groups (n= 25).

**Group D**: will receive a bolus dose of dexmedetomidine (Precedex, Abbot Laboratories Inc., Abbot Park, IL, USA) 1ug/kg over 10 min before induction of anesthesia then iv infusion of 0.1 ug-0.5ug/kg/h guided by hemodynamics

**Group P:** will receive a bolus dose of 10 ml ringer solution before induction of anesthesia, and continuous intraoperative infusion

Preoxygenation for 3- 5 minute with 100% oxygen by facemask, then induction of anesthesia in all patients will be with the use of i.v.propofol 2 mg/ kg, fentanyl 2 µg/ kg, atracurium (0.5mg/kg) and will be ventilated manually with sevoflorane 2 volume % ,oxygen 100% via a face mask then oral cuffed endotracheal tube will be inserted when the BIS value reached (40-60) which indicate optimal hypnotic state10.Muscle relaxation was guided by nerve stimulator ( Life-Tech EZstimII)**, anesthesia will be maintained with oxygen 100%, sevoflorane,** according to the depth of anesthesia measured by BIS to be between 40%-60%**,additional doses of atracurium, mechanical ventilation with maintenance of endtidal carbondioxide 35-40mmHg.**

At the end of surgery, neuromuscular blockade will be reversed with IV neostigmine 0.04mg/kg and atropine 0.02 mg/kg, the trachea will be extubated when the patient respond to commands, all patients was transferred to PACU, where they received oxygen via face mask 3-4 L/min and will be monitored.

**The following parameters will be evaluated and recorded by senior anesthesia resident unaware of the study protocol:**

1. Patients ’s characteristics : age, sex, ASA, height, weight
2. .Heart rate, systolic and diastolic arterial blood pressure, arterial oxygen saturation (SpO2): preinduction, after induction of anesthesia, then every 15 minutes intraoperative
3. Volume of blood loss (ml)
4. Laboratory Hb and haematocrite conc:(Pre, intra and immediate post-operative)
5. Number of PRBCs transfused
6. Urine output every 1 hour

**Statistical analysis:**

 Data be will presented as mean and standard deviation (SD) or median (range) or numbers as appropriate , student t- test be will be used: for comparison between means of two groups, Mann-Whitney U test for nonparametric data, . P values <0.05 will considered statistically significant.

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**تنقيط عقار الديكسميديتوميدين عن طريق الوريد في المرضي البالغين**

**الذين يخضعون للجراحات المفتوحة لاستخراج حصاة الكلية: الآثار على ديناميكة الدم، وفقدان الدم.**

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