

Evaluation of Outcomes in the Administration of Anesthesia for Iraqi Kidney Patients

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Abstract: A cross-sectional study was conducted, and demographic data were collected from different hospitals in Iraq. The study aimed to find out the type of relationship generated between the anesthesia used to Iraqi kidney patients. The study lasted a full year, from 20-3-2021 to 24-5-2022. This study was designed on the basis of standard analysis and real values for patients, where they were divided into two groups according to gender. In addition, all required parameters were analysed before surgery and after surgery to find out the differences that occurred and the effect of the type of anaesthesia used on patients. All required data were analysed according to the Statistical analysis program SPSS IBM, and the type of general complications that occurred after surgery was also identified, and the resulting negative effects were known. The results that were found in this study are that there is no clear relationship between the type of anaesthesia used and kidney patients, and it was found that the death rate is higher in males than females, in addition to the general complications, which included hypertension, vomiting, dizziness, pain, death and. Through this, we conclude that anaesthesia does not have a direct effect on the renal outcomes for Iraqi patients, but it may contribute to other effects that contribute to the lack of improvement in health outcomes for patients.

Keywords: Anaesthesia, Kidney, Outcomes, Patients, Renal, GFR.

INTRODUCTION

In kidney diseases, on the basis of clinical and laboratory data, a number of syndromes are distinguished: nephrotic syndrome, acute renal failure, chronic renal failure, nephritis, urolithiasis, obstruction, and urinary tract infection. Anesthesia planning is facilitated if patients are grouped not according to the mentioned syndromes but depending on the state of renal function prior to surgery [ACC/AHA, 2007].

The elimination of most drugs used during anesthesia depends entirely or in part on renal excretion. Impaired renal function requires dose adjustment to avoid accumulation (accumulation) of the drug or its active metabolites. In addition, azotemia potentiates the action of many drugs [Jones, D. *et al.*, 2009; USRDS, 2010].

This azotemia effect may be due to decreased binding of drugs to plasma proteins, increased permeability of the blood-brain barrier, and synergism of toxins that accumulate in renal failure [Trainor, D. *et al.*, 2011; Nash, K. *et al.*, 2002; Gómez, R, 2006; Joseph, A, 2003].

General and regional anaesthesia causes a reversible decrease in glomerular filtration rate and urine output, and sodium excretion. (Most changes

are mediated by autonomic and hormonal influences rather than by the action of the drugs themselves.) [Motayagheni, N. *et al.*, 2016; Motayagheni, N. *et al.*, 2016; Motayagheni, N. *et al.*, 2016] These changes can be partly avoided by adequately maintaining the BCC. Most anaesthetics cause myocardial depression or vasodilation, thus reducing blood pressure, and anaesthetics Epidural and spinal anaesthesia lead to the sympathetic blockade, which contributes to the development of arterial and venous vasodilation and, consequently, the possible development of arterial hypotension [Motayagheni, N. *et al.*, 2016; Li, J. *et al.*, 2016; Motayagheni, N. *et al.*, 2016].

The choice of anaesthesia technique to preserve renal function during and after surgery depends on maintaining perfusion pressure, suppression of vasoconstriction, stress responses to surgical stimulation, postoperative pain, and in avoiding [Cousins, M.J. *et al.*, 1973] or reducing episodes of nephrotoxicity. From previous studies, no single anaesthetic met these criteria, and all techniques tended to All anaesthetics reduce glomerular filtration rate (GFR) and urine flow during the procedure. Induction of anaesthesia and tracheal intubation can be performed safely with

intravenous medications (propofol, etomidate, thiopental) as well as muscle relaxants such as succinylcholine [Conzen, P.F. et al., 1995; Cousins, M.J. et al., 2017; Hashiguchi, H. et al., 1976].

The potential for hypotension during induction of anaesthesia may be increased if the function of the sympathetic nervous system has been impaired by antihypertensive drugs or by haematuria [Vianna, P.T. et al., 2009; Bracco, D, 2012; Steurer, M.P. et al., 2012].

**PATIENT AND METHOD
COLLECTION SAMPLE**

A cross-sectional study was conducted on 70 patients in Baghdad Governorate - Iraq. This study aims to evaluate outcomes in the administration of anesthesia for Iraqi kidney patients.

The patients were distributed according to gender (44 males - 36 women), and the average age ranged from 30 to 40 years.

STUDY DESIGN

This study was designed by relying on the IBM SOFT spss statistical analysis program, where 70 patients with kidney disease were analyzed.

In this study, the results were classified and distributed according to the age and sex of the patients, where they were classified into three categories from 20 to 30 years. Any stage and it is called the estimator because it is considered an estimate through a mathematical equation of the real rate, which is difficult to measure.

Displays the GFR result in milliliters per minute for a body surface area that is typically 1.73 square meters but can be adjusted for each patient individually; values may vary slightly from laboratory to laboratory.

In general, the reference areas are as follows:

- The normal range is 90 or higher
- 60 to 89 indicates early kidney disease with little loss of function (stage 2)
- The estimated glomerular filtration rate may remain normal, with other signs of kidney damage, such as protein in the urine
- 45 to 59 indicates mild to moderate loss of kidney function (stage 3A), and 30 to 44 indicates moderate to severe loss of kidney function (stage 3B)

Patients participating in this study underwent general anaesthesia in this way, where the patient is entered into a state similar to deep lethargy and maintained in this state until the end of the surgery, and then the patient loses and does not feel pain in any area of his body, after that the doctor begins anaesthesia by injecting it into the vein of the arm with a fast-acting anaesthetic. Also, anaesthetics reduce the glomerular filtration rate and urine output rate, and this can be reduced by raising the water level of the body before the surgery.

Fortunately, most of the effects of the drugs used in anaesthesia go away after a period of time in the body.

Surgical procedures and the resulting stress and tension, in addition to the drugs used in anaesthesia, affect kidney function directly and indirectly, including the effect on the activity of the sympathetic nervous system and hormones. There are many anesthetic drugs that reduce the glomerular filtration rate.

STUDY PERIOD

A written consent was taken from the patients participating in this study, and this study was conducted over a period of one year ranging from 20-3-2021 to 24-5-2022

RESULTS

Table 1: Distribution of patients according to age

Variable	Male	Female	P-value
20-23	20	12	0.43
24-27	10	18	0.02
28-30	14	6	0.22

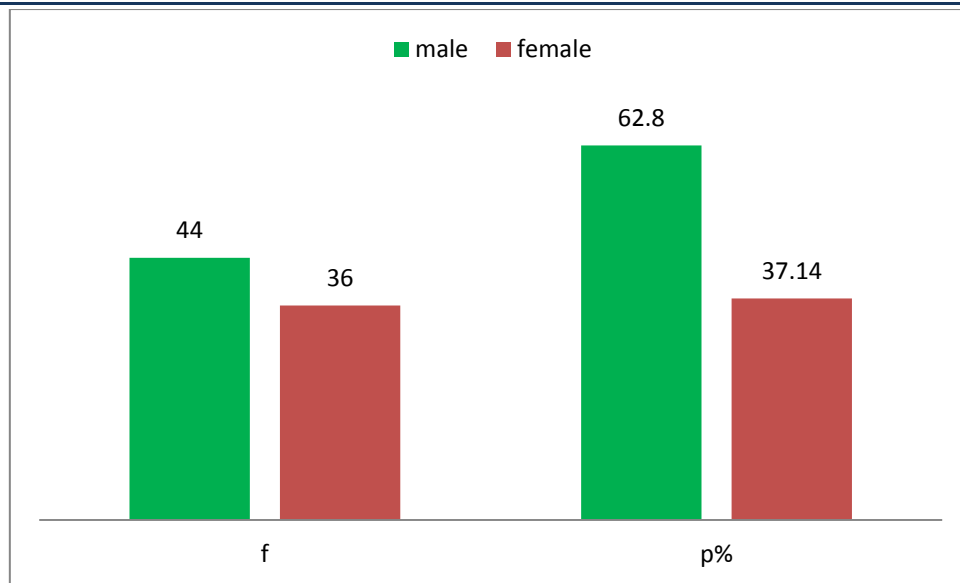


Fig 1: Distribution of patients according to sex

Table 2: Distribution of patients according to comorbidities

Variable	Male	Female
diabetes	15	7
Hypertension	12	10
heart disease	10	7
Other diseases	7	12

Table 3: Outcomes of patients related to BMI

Variable	Male	Female	P-value
21-24	5	5	0.00
25-28	11	14	0.34
29-32	19	8	0.01
>32	11	7	0.44

Table 4: Preoperative GFR (ml/min)

Variable	Male	Female	P-value
20-23	60±6.6	44±8.65	0.001
24-27	55±5.9	39±12	0.23
28-30	40±8.8	51±12.9	0.093

Table 5: Outcomes related to characteristics of stone

Variable	Number of stone	Maximal Size of stone
20-23	3.3±1.9	8.8±3.3
24-27	4.2±1.4	9.3±2.44
28-30	4.1±1.45	10.2±2.1

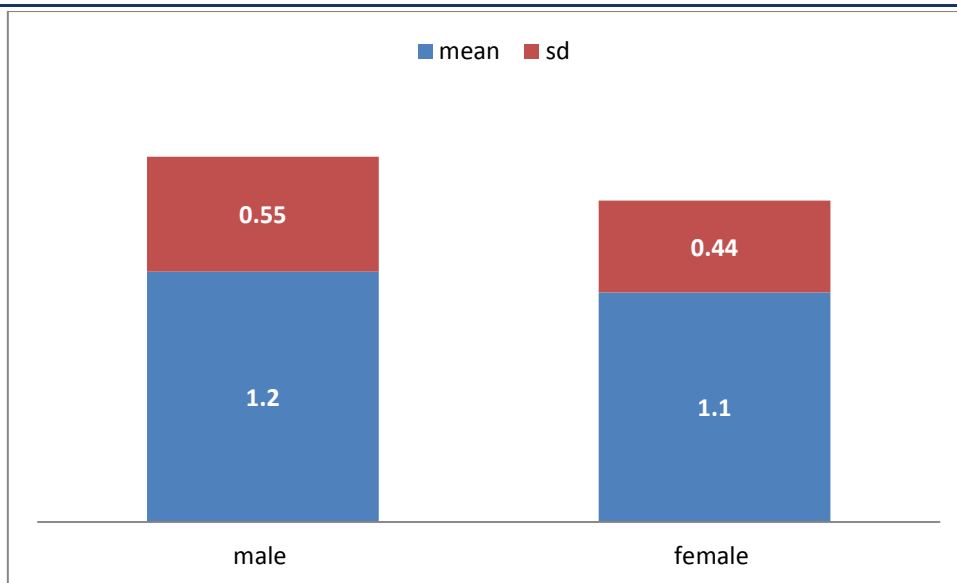


Fig 2: Serum creatinine percentage of patients

Table 6: Patient health outcomes related to anaesthesia

	Male	Female	P-value
anaesthesia time	110±30.1	103±28.2	0.21
Operative time	60.3±22.4	62±29.1	0.89
stone fragmentation (min)	13.1±11.1	12.9±9.9	0.01

Table 7: Evaluate the final results to patients after surgery

Variable	Male	Female	P-value
GFR	81.1±3.95	701±4.9	0.065
Creatinine change value	0.03±0.19	0.054±0.20	0.87
HS	1-4 days	1-5 days	0.9
QOL			
Before	77.4±12.2	68±11.1	0.034
after	39±6.6	33.3±5.9	0.21

HS=hospital stay, QOL=quality of life

Table 8: Assessment of Mortality results at month

	Male	Female	
20-23	1 (2.2%)	0 (0)	0.01
24-27	1 (2.2)	1 (2.7)	0.00
28-30	2 (4.5)	0	0.001

Table 9: Logistic analysis of risk on patients

Variable	OR	CS	P-value
Type of anaesthesia	3.3	1.9-6.6	0.097
Age	1.2	0.87-2.1	0.82
Sex	2.1	1.4-3.9	0.33
comorbidities	2.4	1.4-4.2	0.02
GFR	4.6	3.5-9.8	0.002
Number of stone	5.2	3.9-8.8	0.001
Maximal Size of stone	4.98	3.5-7.5	<0.001

Table 10: Evaluation of the results of anesthesia on general complications on patients

Variable	Male	Female	P-value
Hypertension	22	19	0.89
vomiting	18	17	0.99
dizziness	23	15	0.03
pain	12	8	0.04
death	5	1	0.001

DISCUSSION

This study discussed the effect of anaesthesia on kidney patients in Iraq to patients whose ages ranged from 20 to 30 years.

The most common age in this study was from 20 to 23 years for 32 patients, as shown in Table 1

In Figure 1, the patients were distributed according to gender, and the prevalence of male patients was more than that of females, for 44 male patients with 62.8% – and 36 female patients with 14.37%.

In this study, the GFR was measured. The rate of glomerular filtration, or simply GFR, is a laboratory measurement that allows the general practitioner and nephrologist to assess the function of a person's kidneys.

Making the glomerular filtration rate is also key to determining the best treatment, if necessary.

The glomerular filtration rate aims to check the functioning of the kidneys since it takes into account the dose of substances that are filtered in the kidneys and are not absorbed into the blood since they are mainly eliminated in the urine. The case of creatinine, for example, this protein is filtered by the kidneys, and a small amount of it is reabsorbed into the blood so that, under normal circumstances, urine creatinine concentrations can be much higher than those of the blood.

This study observed a decrease in GFR and the mean values, and the standard regression to the results of our study was $58 + 7.8$.

It was also found that the number of stones and their size increased in patients, especially at the ages of 28-30 years, where the average was 4.1 ± 1.45 and about the maximum size of the stone was 10.2 ± 2.1

In this study, information about anesthesia outcomes was anesthesia time, which was for men 110 ± 30.1 , while for females, it was 103 ± 28.2 , with no statistical differences between them. As for the operating time, the mean for male patients

was 60.3 ± 22.4 , while for females, it was 62 ± 29.1 .

After the surgery, good results were found that contributed to improving patients' outcomes. Stone fragmentation (min) for men was 13.1 ± 11.1 , while for females, it was 12.9 ± 9.9 , with a p-value of 0.01.

Anaesthesia did not have a clear negative effect on the patients, as a significant improvement in the patient's quality of life was noted, in addition to other health outcomes related to the kidneys.

The elimination of most drugs used during anaesthesia depends entirely or in part on renal excretion. Impaired renal function requires dose adjustment to avoid the accumulation of the drug or its active metabolites. In addition, azotemia increases the effect of many drugs. This azotemia effect may be due to decreased binding of drugs to plasma proteins, increased permeability of the blood-brain barrier, and synergism of toxins that accumulate in renal failure [Murry, C.E. et al., 1986; Gidday, J.M, 2006].

Inhalation anesthetics are not excreted by the kidneys, have no marked direct effect on renal blood flow, and allow easy control of blood pressure. For these reasons, they are considered the drugs of choice for use in impaired renal function. [Zhao, Z.Q. et al., 2003; Feng, J. et al., 2006] Mild to moderate renal impairment does not affect the absorption and distribution of the drug, but with severe anemia (Hb < 50 g/L) in patients with chronic renal failure, it may be prescribed. Acceleration of induction of anaesthesia and awakening, which is explained by the change in blood distribution. [Ohsumi, A. et al., 2017]

CONCLUSION

In this study, we conclude that there is no direct relationship between the effect of anaesthesia on the outcomes of kidney patients in Iraq, as it was not found that there is clear statistical relationship from which we infer the negative effect of the type of anaesthesia used in the operation on patients.

Our study coincided with several foreign studies, most notably a study by Nike Calipers in America in 2016. It was also noted that there was a significant improvement in the outcomes of female patients more than males, according to the number of deaths in addition to general complications.

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