FIVE YEARS CHARACTERISTIC OF KIDNEY TRAUMA IN TERTIARY HOSPITAL IN WEST JAVA FROM 2013-2017

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ABSTRACT

Objective: *Globally, trauma is one of the leading cause of mortality and morbidity. Kidney is an organ that is often affected in trauma cases in urology. This study aimed to determine the characteristics of cases of kidney trauma treated in Hasan Sadikin Bandung Hospital, and used as part of the database of urogenital trauma in Indonesia.* ***Material & Methods:*** *The secondary data was derived from the medical records of patients with kidney trauma treated at Department of Urology in Hasan Sadikin Hospital Bandung for 5 years period (January 2013 to August 2017), as many as 130 cases. Information used was patients' gender, mechanism of trauma, grading of kidney trauma, associated injury, management, shock, and outcome after treatment. The data obtained was subsequently recapitulated and processed using a spreadsheet.* ***Results:*** *A total 20489 trauma cases admission in Hasan Sadikin Hospital, 477 cases (2.33%) were urogenital trauma, and 130 of which are cases of kidney trauma (0.63%). The majority of patients with kidney trauma are male (87.7%). Based on the mechanism of trauma, 80% of them were related to traffic accidents, especially in motorcycle traffic accidents, as well as the trauma mechanism of falling from a height (13%). There were 69 patients (53.1%) who had major kidney trauma, and 61 patients (46.9%) had minor kidney trauma; specifically, 42.3% grade I and 21.5% grade V kidney trauma. In general, kidney trauma patients experienced multiple trauma, only 19 cases (14.6%) had not associated injury. Most of patients (63%) did not experience shock, and 87.75% of patients survived after treatment. In the timespan of 5 years, 44 patients underwent McAnninch procedure.* ***Conclusion:*** *In Hasan Sadikin Hospital, most cases of kidney trauma were experienced by men, and were caused by blunt trauma in traffic accidents, especially on motorcyclists. Most patients with kidney trauma experienced multiple trauma.*

Keywords: *Kidney trauma, road traffic accident, urogenital trauma.*

ABSTRAK

Tujuan: *Secara global, trauma merupakan salah satu penyebab terbanyak mortalitas dan morbiditas. Ginjal merupakan organ yang sering terkena trauma pada kasus trauma di bidang urologi. Penelitian ini bertujuan untuk mengetahui karakteristik kasus trauma ginjal yang dirawat di RSUP Dr. Hasan Sadikin Bandung, sehingga dapat disusun sebagai bagian dari database trauma urogenital di Indonesia.* ***Bahan & Cara:*** *Data sekunder berasal dari rekam medis pasien dengan trauma ginjal yang ditangani di SMF Urologi RSUP Dr. Hasan Sadikin Bandung selama 5 tahun (Januari 2013 hingga Agustus 2017), sebanyak 130 kasus. Informasi yang digunakan berupa jenis kelamin pasien, mekanisme trauma, grading trauma ginjal, associated injury, penatalaksanaan, adanya shock, dan outcome setelah tatalaksana. Data yang didapatkan selanjutnya direkapitulasi dan diolah menggunakan spreadsheet.* ***Hasil:*** *Dari total 20489 kasus trauma yang ditangani di RSUP Dr. Hasan Sadikin, 477 (2.33%) merupakan kasus trauma urogenital, dan 130 diantaranya merupakan kasus trauma ginjal (0.63%). Sebagian besar pasien trauma ginjal berjenis kelamin laki-laki (87.7%). Berdasarkan mekanisme trauma, 80% diantaranya berkaitan dengan kecelakaan lalu lintas, terutama pada kecelakaan lalu lintas pada pengendara motor, serta mekanisme trauma berupa jatuh dari ketinggian (13%). Sebanyak 69 pasien (53.1%) mengalami trauma ginjal mayor, dan 61 pasien (46.9%) mengalami trauma ginjal minor; dengan rincian trauma ginjal grade I sebanyak 42.3%, dan 21.5% trauma ginjal grade V. Pada umumnya, pasien trauma ginjal mengalami trauma multipel, hanya 19 kasus (14.6%) tidak disertai injury lain. Sebagian besar (63%) pasien tidak mengalami shock, dan 87.75% pasien survive setelah tatalaksana. Selama kurun waktu 5 tahun tersebut, sebanyak 44 orang pasien diantaranya menjalani prosedur McAnninch.* ***Simpulan:*** *Sebagian besar kasus trauma ginjal dialami oleh laki-laki, dan disebabkan oleh trauma tumpul pada kecelakaan lalu lintas, terutama pada kendaraan sepeda motor. Sebagian besar pasien trauma ginjal mengalami trauma multipel.*

Kata Kunci: *Trauma ginjal, kecelakaan lalu lintas, trauma urogenital.*

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INTRODUCTION

Trauma refers to any injury resulting from various mechanisms and such injuries were found to be the leading cause of death. Traumatic injuries also result in certain morbidity and declining quality of life. Mechanisms leading to any traumatic injury could be either traffic-related, falling, assault, explosions, etc.[1] The kidneys are considered to be the most injured genitourinary and abdominal organ, in which approximately 1-5% of all traumatic injuries are kidney injury.[2]

In the United States, the incidence of kidney trauma is estimated to be around 4.9 per 100.000 persons with high prevalence among men of the age of second decade.[3] The underlying mechanism of kidney trauma might be either blunt or penetrating, however, approximately 90-95% of cases occur after blunt trauma.[4]

OBJECTIVE

In this study we aimed to present the characteristics of kidney trauma cases presenting in a tertiary hospital in West Java, Indonesia, within a five-year period from year 2013 to 2017.

MATERIAL & METHODS

This retrospective study use secondary data obtained from medical records of kidney trauma patients who were treated at Department of Urology Hasan Sadikin Hospital Bandung. The records included were those presenting in the year 2013 to 2017. The kidney trauma characteristics included in this study were patients' gender, mechanism of trauma, grading of kidney trauma, presence of associated injury, management of kidney trauma, shock, and outcome after treatment. These measures were then recapitulated and processed by using spreadsheet.

RESULTS

A total of 20.489 trauma cases presented to our hospital in the period of year 2013-2017. Of these 20.489, 477 (2.33%) cases were urogenital trauma, in which 130 cases were kidney trauma (0.63%).

The majority of patients were male (n=114). As for the underlying mechanism, traffic accident, particularly motorbike accidents were found to be the most frequent (80%), followed by falling from particular heights.

Table 1. Sex distribution.

Sex	n	%
Male	114	87.7
Female	16	12.3

Table 2. Mechanism of kidney trauma.

Mechanism of trauma	n	%
Traffic accident	104	80
Falling from height	17	13
Others	9	7

There were 69 patients diagnosed with major renal trauma and 57 patients with minor renal trauma; specifically 42.3% of cases were grade I and 21.5% were grade V renal trauma.

Table 3. AAST grade of kidney trauma.

Grade	n	%
Major	69	53.1
Minor	61	46.9
Grade I	55	42.3
Grade II	6	4.6
Grade III	17	13.1
Grade IV	24	18.5
Grade V	28	21.5

In general, most patients experienced multiple trauma; only 19 cases (14.6%) had no associated injury. Shock was absent in most patients (63%).

Table 4. Associated injury and shock.

Condition	n	%
Associated Injury		
Present	111	85.4
Absent	19	14.6
Shock		
Absent	82	63
Present	48	37

Fifty five patients (42.3%) did not undergo surgical procedure, and the rest are operated with various methods. Within the 5-year period, McAnninch procedure was performed in only 44 cases. As for the outcome, survival was observed in 87.7% cases.

Table 5. Treatment of kidney trauma and the outcome.

Treatment	n	%
NOM	55	42.3
Nephrectomy	26	20
Renorraphy	10	7.7
Others	39	30
McAninch Procedure	44	33.8
Outcome		
Survive	114	87.7
Dead	16	12.3

DISCUSSION

The majority of male patients in this study is similar with some previous studies. In a study in Oman, 17 out of 22 renal trauma patients were male.[5] A cohort study conducted by Dagenais et al., also revealed that approximately 78.4% out of 21.531 renal trauma patients were male.[6]

According to the Consensus on Genito-urinary Trauma, renal trauma is considered as a disease of the young, particularly men of age 20-30 years, and this might be due to male involvement in high-risk activities, i.e motor vehicle crashes, contact sports, and violent crime.[3]

Kidney trauma is classified as blunt or penetrating.[7] Blunt mechanisms contribute to most of renal injury cases in several regions, meanwhile, motor vehicle crashes and falls result in kidney trauma in the developed world.[3] Penetrating trauma is then classified according to the projectile velocity: high-velocity (800-1000 m/sec), medium-velocity (200-300 m/sec), and low-velocity (i.e knife stab).[2] As for penetrating trauma, gunshot and stab wounds are found to be the most frequent underlying mechanisms.[8] In this study, traffic accident, particularly those associated with motorbike accidents, contributes to the most frequent underlying mechanism of renal trauma. Road traffic accidents were also found to be most dominant underlying cause of renal trauma in another study.[5]

Penetrating injuries are more prevalent in undeveloped countries and areas with civil unrest. A retrospective, 4-year single institution study from a hospital serving 13 smaller cities throughout southeastern Turkey, a region with elevated sociopolitical tensions and a gun in every residence for self-defense and hunting, reported 59% (42/71) of renal injuries were secondary to gun-shot wounds. Similarly, 75% (130/174) of renal injuries reported by one hospital in Durban, South Africa were from a penetrating source, with 50% (87/174) due to gun-shot wounds.[9]

The Committee on Organ Injury Scaling of the American Association for the Surgery of Trauma (AAST) classified renal injury as grade I, II, III, IV, and V according to involvement of certain renal structures and its vascular properties.[8] Patients with grade I, II, and II injuries would most likely be haemodinamically stable, while grade IV and V injuries might require initial resuscitation to achieve a stable state.[5]

The kidneys are anatomically well protected and only major forces would result in renal injuries, which explains the high percentage of coexisting abdominal lesions, especially in major renal trauma.[3] In our study, only 14.6% cases were not accompanied by other associated injury. Shock was not observed in 63% of cases. As previously explained, shock is more likely to occur in the more severe injury, as in grade IV or V injury.[5] Vital signs and serial hematocrit values are the parameters important for assessment of renal injury. Non-invasive measure and management must always be performed in haemodinamically-stable patients.[1]

Different measures might be taken in depends on cases, whether is an adult blunt renal trauma or pediatric blunt renal trauma. Renal

Table 6. Classification of renal injury.

Grade I	Contusion or non-expanding subcapsular hematoma. No laceration
Grade II	Non-expanding perirenal hematoma cortical laceration <1 cm deep without extravasation
Grade III	Cortical laceration >1 cm without urinary extravasation
Grade IV	Laceration: through corticomedullary junction into collecting system or Vascular: segmental renal artery or vein injury with contained hematoma
Grade V	Laceration: shattered kidney or Vascular: renal pedicle injury or avulsion

exploration or Mc Aninch procedure is performed under various circumstances.[10] According to Guidelines on Urological Trauma, renal exploration might be performed if haemodynamic instability is present, aiming for exploration for associated injuries, presence of expanding or pulsatile peri-renal hematoma identified during laparotomy, or grade V vascular injury.[2]

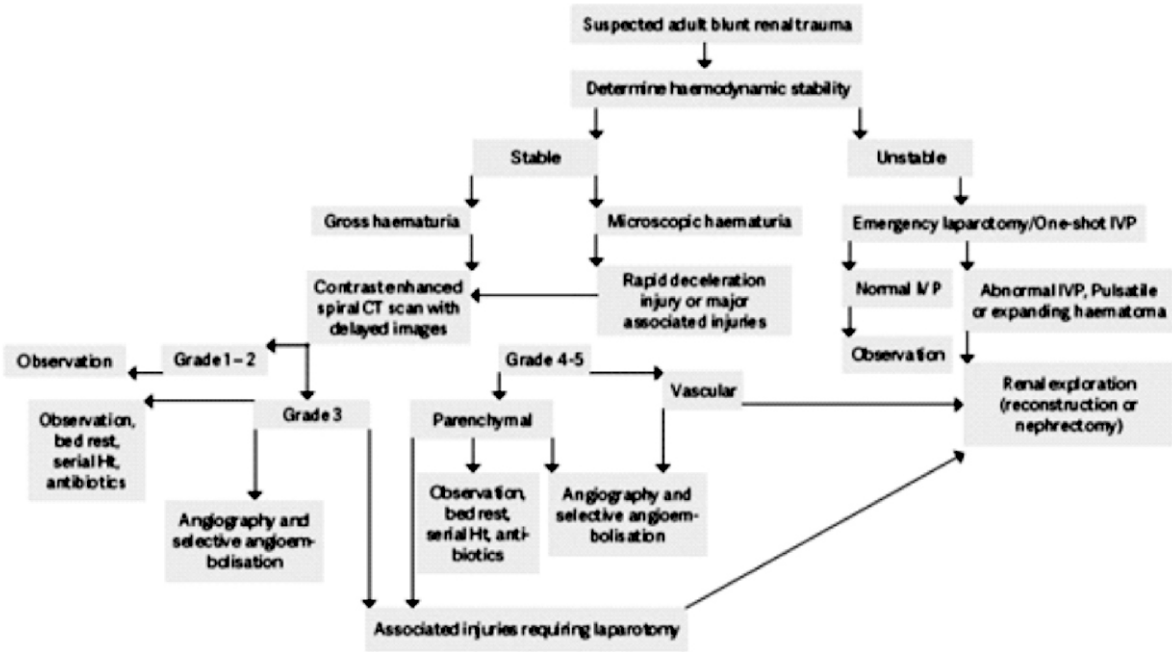

Figure 1. Evaluation of adult blunt renal trauma.[2]

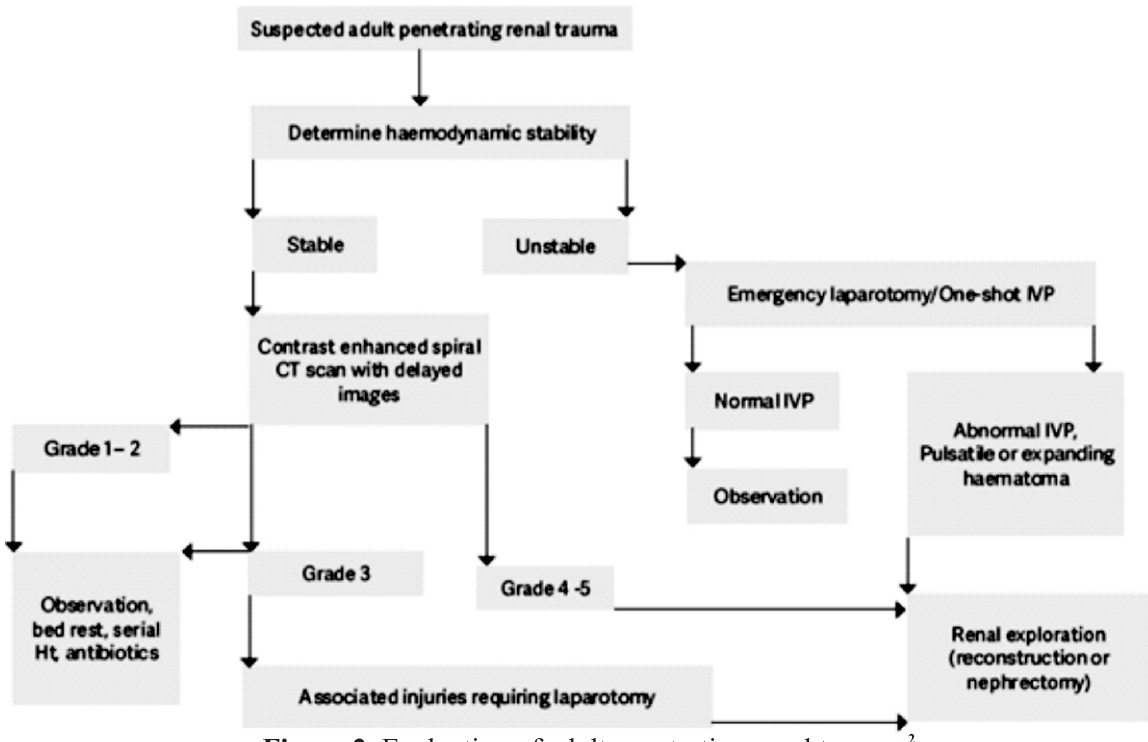

Figure 2. Evaluation of adult penetrating renal trauma.[2]

CONCLUSION

In Hasan Sadikin Hospital, most cases of renal trauma were experienced by men, and were caused by blunt trauma due to traffic accidents, especially those related with motorcycle accident. Most patients with kidney trauma experienced major trauma with other associated injury.

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