Contemporary outcomes of patients with traumatic renal injury

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I. Introduction

- Traumatic renal injury is significant in trauma patients, with historical morbidity and mortality rates of 33% and 14%, respectively[1]
- Nonoperative management (NOM) of these injuries has become widely adopted over the last several decades[1-3]
- Parameters predictive of operative management, such as mechanism of injury and severity, have been examined extensively[2-3]
- Factors, such as intervention type or patient characteristics, that could be predictive of patient outcomes have not been well-studied
- Thus we sought to identify parameters associated with adverse outcomes in traumatic renal injury

II. Materials and Methods

- Using the 2017 National Trauma Databank (NTDB), we identified patients who sustained a traumatic renal parenchymal injury
- Demographic data, trauma type, injury severity, hospital length of stay, death under care, and type of intervention (angioembolization vs surgery) were abstracted
- To determine if certain parameters were associated with intervention type or death under care, statistical analysis was performed using Pearson's chi-squared test and simple and multiple logistic regression

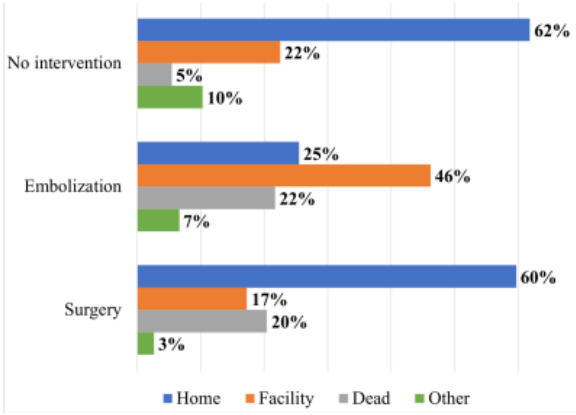
III. Results

Table 1: Demographics of traumatic renal injury patients

		No Intervention	Intervention	Total	p-value
Gender (%)					
	Male	3,293 (93)	232 (7)	3,525	0.021
	Female	1,286 (95)	65 (5)	1,351	
Race (%)					
	White	3,084 (96)	141 (4)	3,225	<0.001
	Black	700 (87)	102 (13)	802	
	Other	795 (94)	54 (6)	849	
Age group (%)					
	<16	470 (98)	10 (2)	480	<0.001
	16-20	552 (92)	51 (8)	603	
	21-44	1,941 (92)	161 (8)	2,102	
	45-64	992 (95)	47 (5)	1,039	
	65+	624 (96)	28 (4)	652	
Trauma type (%)					
	Blunt	4,025 (96)	153 (4)	4,178	<0.001
	Penetrating	518 (78)	143 (22)	661	
	Other	36 (97)	1 (3)	37	
Injury Severity Score (%)					
	1-8	740 (99)	8 (1)	748	<0.001
	9-15	1,162 (98)	20 (2)	1,182	
	16-24	1,316 (95)	64 (5)	1,380	
	25+	1,361 (87)	205 (13)	1,566	

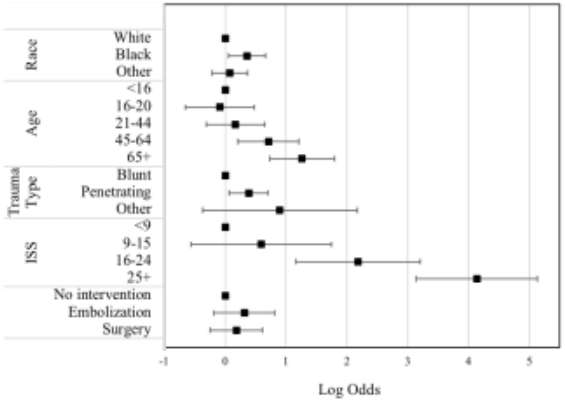
- In 2017, 4,876 (0.5%) trauma patients sustained a traumatic renal injury

Figure 1: Hospital disposition of traumatic renal injury patients by type of intervention received.



IV. Results

Figure 2: Multiple logistic regression model of death under care for traumatic renal injury patients.



Reference values: race = white, age <16, trauma type = blunt, ISS <9, and no intervention

V. Conclusions

- Traumatic renal injury is an uncommon but significant event, for which NOM continues to be the mainstay of treatment
- While procedural interventions are associated with higher mortality rates, our findings suggest that other factors, such as race, age, trauma type, and injury severity, are more predictive of death under care

References

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2. Keihani S, Xu Y, Presson A, et al (2018), Contemporary management of high-grade renal trauma: Results from the American Association for the Surgery of Trauma Genitourinary Trauma Study. Journal of Trauma and Acute Care Surgery, 84:418-425.
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Research Summary

Data Abstraction

- Source: 2017 National Trauma Databank
- Traumatic renal injury and explorative surgery identified with ICD-10 diagnosis and procedure codes
  - S37.0 codes corresponding to injury of the kidney
  - Procedure codes for open repair, resection, excision, or extraction of the kidney
- Additional abstracted data:
  - Gender
  - Race
  - Age
  - Injury Severity Score
  - Trauma Type
  - Angioembolization, if performed
  - Hospital disposition and length of stay

Analysis

- Association between demographic / trauma parameters and receiving an intervention tested by
  - Division into intervention / nonintervention groups
  - Further subdivision into gender, race, age, trauma type, and ISS groups and compared with intervention incidence using chi-squared test
- Similarly tested the association between type of intervention received and hospital disposition
- Tested parameters predictive of death under care with
  - Simple logistic regression
  - Multiple logistic regression with variables found significant on univariate analysis