**EMERGENCY DEPARTMENT ACUTE KIDNEY INJURY (ED-AKI)**

**has HIGH incidence and mortality.**

**INCIDENCE**

- **20** per 1000 adult ED attendances

**MORTALITY**

- **24h: 4.56%**
- **1yr: 35.04%**

Clinical Epidemiology and Outcomes of Emergency Department-Acute Kidney Injury: A Systematic Review

Tsz Yan Cheung, Kelvin Lam, Siu Chung Leung, Timothy H Rainer

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**INTRODUCTION**

- Prevalence: **216** per 1000 adult patients
- AKI Mortality Rate: Up to **20%**
- >50% community-acquired AKI first present to ED

What is ED-AKI?

- Poorly understood with no systematic review

**OBJECTIVES**

- Describe incidence & demographics of ED-AKI
- Identify ED-AKI risk factors
- Describe ED-AKI outcomes
- Describe risk factors for ED-AKI mortality

**METHODS**

**Study Design:** Systematic Review

**Eligibility:** Prospective / retrospective observational studies, controlled trials, systematic reviews reporting AKI in adult ED attendees

**Search:** PubMed database, 1/1/1996-14/8/2021

**Study Selection:** Titles and abstracts by 2 independent reviewers ➔ Discrepancies settled by 4 reviewers. Shortlisted papers’ full text were screened via the same process.

**Risk of Bias Assessment:** The National Heart, Lung, and Blood Institute (NHBLI) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies

**Data Synthesis & Analysis:** R was used to create a forest plot summarizing ED-AKI incidences and 95% confidence intervals with a random-effects model. Heterogeneity was assessed by I² statistics. Descriptive summary was performed for other data.

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**RESULTS**

- **Papers Identified**
  - Initial Search: 821 records –title & abstract screening ➔ 54 articles –full-text screening ➔ 6 articles

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**DISCUSSION**

**Limitations**

- Few papers could be identified
- Heterogeneity of ED-AKI incidences
- No adjusting for confounders in analyzing risk factors for ED-AKI and mortality

**Implications**

- High burden of ED-AKI: High incidence & mortality
- Vs General AKI:
  - ED-AKI has **HIGHER** mortality
  - Risk factors differ

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**Risk Factors of ED-AKI**

- Demographics: ↑Age, Nursing home, Previous hospital admission within 30 days
- Discharge diagnosis: Diabetes, obstructive uropathy, sepsis, gastrointestinal medical conditions
- Admission Blood Test: ↑Serum creatinine, bilirubin, C-reactive protein, white blood cell, alanine aminotransferase, ↓Serum Na/ albumin
- Premorbid Health: Poor premorbid renal function, antibiotic use, active malignancy, lung disease, hyperlipidaemia, and infection

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**Risk Factors of ED-AKI Mortality**

- ↑Age
- Co-morbidities: Cardiovascular disease, Malignancy

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**Incidence of ED-AKI**

<table>
<thead>
<tr>
<th>Study of Subgroup</th>
<th>Events</th>
<th>Total (95% CI)</th>
<th>GLMM Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population = All ED Attendances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 2019</td>
<td>5600.0</td>
<td>82239.0</td>
<td>30.0</td>
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<tr>
<td>June 2020</td>
<td>5600.0</td>
<td>82239.0</td>
<td>30.0</td>
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<tr>
<td>Stacker 2017</td>
<td>5600.0</td>
<td>82239.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>112400.0</td>
<td>164478.0</td>
<td>20.0</td>
</tr>
</tbody>
</table>

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**Other related entities**

- Further research
- Identify red flags for suspicion
- Standardized protocol for suspected AKI management at ED