**Supplementary Content**

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**Supplementary Table 1:** Kidney Disease Improving Global Outcome (KDIGO) AKI Definition Criteria for AKI.

|  |  |  |
| --- | --- | --- |
| **Stage** | **Serum Creatinine** | **Urine Output** |
| 1 | 1.5–1.9 times baselineOR Increase of ≥ 0.3 mg/dl (≥ 26.5 mmol/l) | < 0.5 ml/kg/h for 6–12 hours |
| 2 | 2.0–2.9 times baseline | < 0.5 ml/kg/h for ≥ 12 hours |
| 3 | 3.0 times baselineORIncrease of ≥ 4.0 mg/dl (≥ 353.6 mmol/l) ORInitiation of renal replacement therapyORIn patients < 18 years, decrease in eGFR to < 35 ml/min per 1.73 m2 | < 0.3 ml/kg/h for ≥ 24 hoursORAnuria for ≥ 12 hours |

**Supplementary Table 2:** The Average (Range) SCr Norms for Age and Sex in Alberta Clinical Laboratories (in μmol/L)

|  |  |  |
| --- | --- | --- |
| Age  | Female | Male  |
| 0-23 months | 30 (10-40) | 30 (10-40) |
| 2-5 years | 32 (20-45) | 32 (20-45) |
| 6-12 years | 48 (20-75) | 48 (20-75) |
| 13-14 years | 63 (30-95) | 63 (30-95) |
| 15-150 years | 70 (40-100) | 85 (50-120) |

Source: https://www.albertahealthservices.ca/webapps/labservices/index.asp?id=230&tests=&zoneid=1&details=true

**Supplementary Table 3:** Annual Incidence Rates for AKI and Severe AKI

1. Stratified by age-group for AKI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age category** | **AKI cases** | **Population size** | **Annual incidence** **(per 100,000)** | **Incidence Rate Ratio****(95% CI)** |
| **Less than 1 year** | 129 | 55,714 | 232 | 11.0(8.77 – 13.80) |
| **1-4 years** | 51 | 214,647 | 24 | 0.64(0.47 – 0.86) |
| **5-9 years** | 36 | 261,001 | 14 | 0.32(0.23 – 0.46) |
| **10-14 years** | 54 | 232,620 | 23 | 0.62(0.46 – 0.83) |
| **15-17 years** | 38 | 142,263 | 27 | 0.76(0.54 – 1.06) |
| **1 mon – 17 yrs** | 308 | 906,245 | 34 |

1. Stratified by age-group for severe AKI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age category** | **Severe AKI cases** | **Population size** | **Annual incidence** **(per 100,000)** | **Incidence Rate Ratio****(95% CI)** |
| **Less than 1 year** | 60 | 55,714 | 108 | 14.77(10.36 – 21.07) |
| **1-4 years** | 22 | 214,647 | 10 | 0.69(0.44 – 1.10) |
| **5-9 years** | 13 | 261,001 | 5 | 0.30(0.16 – 0.51) |
| **10-14 years** | 18 | 232,620 | 8 | 0.49(0.30 – 0.81) |
| **15-17 years** | 11 | 142,263 | 8 | 0.52(0.28 - 0.97) |
| **1 mon-17 yrs** | 124 | 906,245 | 14 |

1. Stratified by sex for AKI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **AKI cases** | **Population size** | **Annual incidence** **(per 100,000)** | **Relative Risk****(95% CI)** |
| **Male** | 170 | 465,058 | 37 | 1.17(0.93 – 1.46) |
| **Female** | 138 | 441,187 | 31 |
| **All** | 308 | 906,245 | 34 |

1. Stratified by sex for severe AKI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Severe AKI cases** | **Population size** | **Annual incidence** **(per 100,000)** | **Relative Risk****(95% CI)** |
| **Male** | 77 | 465,058 | 17 | 1.55(1.08 – 2.33) |
| **Female** | 47 | 441,187 | 11 |
| **All** | 124 | 906,245 | 14 |

**Supplementary Table 4:** Number of AKI Cases According to Criteria Used in AKI Diagnosis

|  |  |  |  |
| --- | --- | --- | --- |
| Stage | Both Criteria  | SCr-AKI | U-AKI |
| 1 | 17 | 87 | 80 |
| 2 | 19 | 49 | 11 |
| 3 | 30 | 9 | 6 |
| Total | 66 (21%) | 145 (47%) | 97 (32%) |

SCr-AKI: AKI diagnosed based on serum creatinine criteria

U-AKI: AKI diagnosed based on urine output criteria

**Supplementary Table 5:** AKI Association with Outcomes According to Definition Criteria Used in Diagnosis

 [presented as count (percentage) and means (95% CI) with odds ratio (OR) and mean difference (MD), as appropriate]

|  |  |  |  |
| --- | --- | --- | --- |
|  | Both Criteria | SCr-AKI | UOP-AKI |
| PICU Mortality | 12(18.2%)  | 7(4.8%)  | 2(2.1%) |
| Reference | OR 0.23(0.09 – 0.61)  | OR 0.09(0.02 – 0.44) |
| PICU LOS (days) | 13.2 (7.0 – 19.5) | 4.6 (3.6 – 5.7) | 9.6 (5.4 – 13.8) |
| Reference | MD -8.60 (-13.68 to -3.52) | MD -3.63 (-9.08 to 1.83) |
| Receipt of Mechanical Ventilation | 54 (81.8%) | 89 (61.4%) | 47 (48.5%) |
| Reference | OR 0.35 (0.17 – 0.72) | OR 0.21 (0.10 – 0.44) |
| Receipt of Vasoactive Support | 47 (71.2%) | 78(53.8%) | 19 (19.6%) |
| Reference | OR 0.47(0.25 – 0.88) | OR 0.09 (0.05 – 0.20) |
| Renal Replacement Therapy | 18 (27.2%) | 2 (1.4%) | 2 (2.1%) |
| Reference | OR 0.03(0.01 – 0.17) | OR 0.06 (0.01 – 0.25) |

**Supplementary Table 6:** Severity of AKI According to Criteria Used in Diagnosis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Not severe AKI | Severe AKI | Total | OR (95%) |
| Both Criteria | 17(25.7 %) | 49(74.4 %) | 66 | Reference  |
| SCr-AKI  | 87(60 %) | 58(40%) | 145 | 0.23 (0.12 – 0.44)p <0.001 |
| UOP-AKI | 80(82.5 %) | 17(17.5 %) | 97 | 0.07 (0.03 – 0.16)p <0.001 |

SCr-AKI: AKI diagnosed based on serum creatinine criteria

U-AKI: AKI diagnosed based on urine output criteria

**Supplementary Table 7:** AKI Duration (days) According to Criteria Used in Diagnosis

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean | 95% CI | Mean Difference (95% CI) |
| Both Criteria  | 3.47 | 2.75- 4.19 | Reference  |
| SCr-AKI | 2.01  | 1.77 - 2.25 | -1.46 (-1.96 to -0.95)p <0.001 |
| UOP-AKI | 1.10  | 1.02- 1.18 | -2.36 (-2.91 to -1.82)p <0.001 |

SCr-AKI: AKI diagnosed based on serum creatinine criteria

U-AKI: AKI diagnosed based on urine output criteria

**Supplementary Table 8:** AKI Case-mix According to Criteria Used in Diagnosis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diagnosis category | Both Criteria | SCr-AKI | U-AKI | Total |
| Shock | 9(29.0%) | 20(64.5%) | 2(6.5%) | 31 |
| Respiratory |  8(15.7%) | 9(17.17%) | 34(66.8%) | 51 |
| Central nervous system | 1(5.9%) | 6(35.3%) | 10(58.8%) | 17 |
| Cardiac | 36(28.4%) | 71(55.9%) | 20(15.8%) | 127 |
| Post-surgery | 3(9.1%) | 10(30.3%) | 20(60.6%) | 33 |
| Trauma | 4(21.1%) | 9(47.4%) | 6(31.6%) | 19 |
| Other | 5(16.7%) | 20(66.8%) | 5(16.8%) | 30 |
| Total | 66 | 145 | 97 | 308 |

**P < 0.001**

**Supplementary Table 9:** Annual Mortality Rates for AKI

1. Comparing age-groups

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age category** | **AKI Mortality cases** | **Population size** | **Annual mortality rate****(per 100,000)** | **Incidence Rate Ratio****(95% CI)** |
| **Less than 1 year** | 10 | 55,714 | 17.9 | 13.87(5.89 – 32.67) |
| **1-4 years** | 5 | 214,647 | 2.3 | 1.40(0.51 - 3.82) |
| **5-9 years** | 3 | 261,001 | 1.1 | 0.41(0.12 – 1.40) |
| **10-14 years** | 2 | 232,620 | 0.9 | 0.30(0.71- 1.31) |
| **15-17 years** | 1 | 142,263 | 0.8 | 0.26(0.04 – 2.00) |
| **1 mon – 17 yrs** | 21 | 906,245 | 2.3 |

1. Comparing sex

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **AKI mortality cases** | **Population size** | **Annual mortality rate****(per 100,000)** | **Incidence Rate Ratio****(95% CI)** |
| **Male** | 12 | 465,058 | 2.6 | 1.26(0.53 – 3.00) |
| **Female** | 9 | 441,187 | 2.0 |
| **All** | 21 | 906,245 | 2.3 |

**Supplementary Table 10:** AKI Stage Association with Secondary Outcomes

|  |  |  |  |
| --- | --- | --- | --- |
| Outcome | Stage 1 | Stage 2 | Stage 3 |
| PICU LOS  | 3.42(1.87 – 4.97) | 2.57(0.31 – 4.84) | 5.21(2.02 – 8.40) |
| Hospital LOS  | 8.21 (0.40 – 16.02) | 15.99(4.60 – 27.39) | 22.36(6.27- 38.44) |
| Length of Mechanical ventilation | 2.17(0.85 – 3.52) | 1.92(0.02- 3.84) | 3.30(0.57 – 6.02) |
| Length of inotrope use | 0.70(0.22 – 1.17) | 1.69(1.00 – 2.38) | 2.28(1.31 – 3.26) |

Reported as *B* regression coefficient in days (95% CI)

Adjusted for weight, site, diagnosis, and PIM3

All p <0.05

**Supplementary Table 11:** Severe AKI Association with Outcomes Adjusting for Fluid Overload

|  |  |
| --- | --- |
| Variables  | Adjusted OR or B Coefficient (95% CI) |
| PICU Mortality  | 8.70 (3.29–22.98) |
| Hospital Mortality  | 6.79 (2.90–15.93) |
| 1-year Mortality  | 4.74 (2.34–9.64) |
| PICU LOS (days) | *B*=2.44 (0.01– 4.89) |
| Length of Mechanical ventilation (days) | *B=*2.41(0.16 –4.65) |
| Length of inotrope use (days) | *B=*2.21 (1.19–3.24) |

Reported as odds ratio (95% CI) or *B* regression coefficient (95% CI)

Adjusted for weight, site, diagnosis, PIM3 and fluid overload

All p <0.05

**Supplementary Table 12:** Severe AKI Association with Outcomes Excluding Cardiac Patients

|  |  |
| --- | --- |
| Variables  | Adjusted OR or B Coefficient (95% CI) |
| PICU Mortality  | 10.22 (3.78–27.65) |
| Hospital Mortality  | 10.14 (4.09–25.16) |
| 1-year Mortality  | 5.56 (2.58–12.00) |
| PICU LOS (days) | *B*=5.53 (2.80– 8.27) |
| Length of Mechanical ventilation (days) | *B=*4.43 (1.89 – 29.12) |
| Length of inotrope use (days) | *B=*2.01 (0.69– 3.32) |

Reported as odds ratio (95% CI) or *B* regression coefficient (95% CI)

Adjusted for weight, site, diagnosis and PIM3

All p <0.05