**Supplemental Table 1: Complete list of the admission biochemical characteristics of validation cohort patients with AP**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SAP****(n=22)** | **Mild AP****(n=51)** | ***p*-value** |
| **Lipase x ULN** | 23.8 (5.6-45.9) *n=21* | 12.3 (6.9-42.9) *n=48* | 0.66 |
| **Amylase x ULN** | 4.1 (2.4-10.5) *n=19* | 2.2 (1.4-7.1) *n=40* | 0.15 |
| **Albumin, g/dL** | 3.3 (3.1-4.2) *n=21* | 4.0 (3.6-4.6) *n=47* | **0.005** |
| **Anion Gap, mmol/L** | 12.0 (8.0-16.0) *n=21* | 12.0 (10.0-15.0) *n=51* | 0.74 |
| **WBC, 103/microL** | 13.1 (5.8-17.3) *n=19* | 9.8 (6.5-13.8) *n=39* | 0.38 |
| **Creatinine, mg/dL** | 0.5 (0.4-0.7) *n=22* | 0.5 (0.4-0.7) *n=51* | 0.94 |
| **Calcium, mg/dL** | 9.2 (8.8-9.5) *n=22* | 9.3 (8.9-9.7) *n=51* | 0.29 |
| **AST, Unit/L** | 32.0 (24.0-63.0) *n=21* | 38.0 (22.0-80.0) *n=47* | 0.69 |
| **ALT, Unit/L** | 29.0 (21.0-57.0) *n=21* | 31.0 (24.0-135.0) *n=47* | 0.39 |
| **Hematocrit, %** | 39.4 (33.2-41.9) *n=19* | 37.3 (34.4-39.8) *n=39* | 0.53 |
| **Hemoglobin, g/dL** | 13.7 (11.0-14.5) *n=19* | 12.9 (11.7-14.1) *n=39* | 0.89 |
| **BUN, mg/dL** | 14.5 (11.0-19.0) *n=22* | 11.0 (8.0-13.0) *n=51* | **0.002** |
| **Alk Phosphorus, Unit/L** | 163.0 (137.0-207.0) *n=21* | 138.5 (91.0-225.0) *n=46* | 0.54 |
| **Glucose, mg/dL** | 97.5 (80.0-138.0) *n=22* | 99.0 (89.0-118.0) *n=51* | 0.75 |
| **Triglyceride, mg/dL** | 49.5 (35.0-69.0) *n=10* | 68.0 (50.0-115.0) *n=21* | 0.06 |
| **Sodium, mmol/L** | 138.5 (136.0-140.0) *n=22* | 140.0 (138.0-142.0) *n=51* | 0.11 |
| **Chloride, mmol/L** | 103.5 (101.0-106.0) *n=22* | 104.0 (101.0-106.0) *n=51* | 0.91 |
| **Total Bilirubin, mg/dL** | 0.5 (0.4-0.9) *n=21* | 0.6 (0.4-1.1) *n=47* | 0.50 |
| **CRP, mg/dL** | 1.3 (0.5-6.6) *n=11* | 1.1 (0.6-3.0) *n=29* | 0.83 |
| **Potassium, mmol/L** | 4.1 (3.9-4.6) *n=21* | 4.1 (3.7-4.4) *n=51* | 0.64 |
| **Total protein, g/dL** | 6.6 (5.9-7.6) *n=21* | 7.1 (6.5-7.5) *n=47* | 0.20 |
| **Platelet count, 103/microL** | 288.0 (154.0-393.0) *n=19* | 261.0 (219.0-326.0) *n=39* | 0.67 |
| **CO2, mmol/L** | 24.5 (18.0-27.0) *n=22* | 24.0 (22.0-25.0) *n=51* | 0.93 |

Data presented as median (25th-75th percentile) or n (%)

**Supplemental Table 2: BUN Change admission to 24-48 hours, patient characteristics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All****N=176** | **Mild AP****N=137** | **SAP\*****N=39** | **P-value†** |
| **Age at admission (years)** | 13.5 (8.7, 15.6) | 13.5 (9.3, 15.6) | 12.3 (7.7, 15.5) | 0.29 |
| **Sex (female)** | 96 (55%) | 77 (56%) | 19 (49%) | 0.41 |
| **Fluid type** **Isotonic** **Hypotonic** **TPN/Other** | 58/157 (37%)88/157 (56%)11/157 (7%) | 47/121 (39%)67/121 (55%)7/121 (6%) | 11/36 (31%)21/36 (58%)4/36 (11%) | 0.37 |
| **Fluid rate** **< 1.5x maintenance** **1.5 - <2x maintenance** **≥ 2x maintenance** | 76/160 (47%)70/160 (44%)14/160 (9%) | 58/122 (48%)52/122 (43%)12/122 (10%) | 18/38 (47%)18/38 (47%)2/38 (5%) | 0.73 |
| **Feeds on admission** **NPO** **Clear liquid diet** **PO general diet** **PO low fat diet** **Feeds through existing enteral tube** | 134/165 (81%)17/165 (10%)10/165 (6%)3/165 (2%)1/165 (1%) | 101/128 (79%)16/128 (13%)7/128 (5%)3/128 (2%)1/128 (1%) | 33/37 (89%)1/37 (3%)3/37 (8%)0/37 (0%)0/37 (0%) | - |
| **IV bolus within 6 hours** | 103/162 (64%) | 75/125 (60%) | 28/37 (76%) | 0.08 |
| **BUN admission (mg/dL)** | 11.0 (8.0, 15.0) | 10.0 (8.0-13.0) | 15.5 (11.0-22.5) | <0.0001 |
| **BUN 24-48hrs (mg/dL)** | 8.0 (6.0, 12.0) | 7.0 (5.0-10.0) | 12.5 (8.0-19.0) | <0.0001 |
| **BUN change (mg/dL)** | -3.0 (-6.0, -1.0) | -3.0 (-5.0, -1.0) | -3.5 (-7.0, -1.0) | 0.32 |
| **BUN no change admission-24hrs** | 15/143 (10%) | 13/109 (12%) | 2/34 (6%) | 0.52 |
| **BUN percent change from admission (includes all)** | -23.5 (-44.4, -9.1)*n=143* | -27.3 (-50.0, -9.1)*n=109* | -19.1 (-32.4, -9.4)*n=34* | 0.22 |
| **BUN percent rise from admission (for those increased)** | 25.0 (10.0, 40.0)*n=15* | 25.0 (16.7, 40.0)*n=13* | 19.8 (6.3, 33.3)*n=2* | 0.60 |
| **BUN percent decrease from admission (for those decreased)** | -33.3 (-50.0, -20.0)*n=113* | -35.7 (-52.9, -22.2)*n=83* | -21.5 (-38.5, -12.5)*n=30* | 0.002 |
| **BUN elevated admission (>20 mg/dL)** | 15/162 (9%) | 3/126 (2%) | 12/36 (33%) | <0.0001 |
| **BUN elevated 24hrs (>20 mg/dL)** | 10/145 (7%) | 2/111 (2%) | 8/34 (24%) | 0.0001 |
| **BUN elevated both at admission & at 24 hours (>20 mg/dL)** | 10/143 (7%) | 2/109 (2%) | 8/34 (24%) | 0.0002 |

Data presented as median (25th-75th percentile) or n (%).

\*SAP (moderately severe and severe AP)

†P-value is from testing differences between the Mild AP and SAP groups

**Supplemental Table 3: BUN Values and Resultant Statistics**

**A. Derived from the CHKD and CNH Data (n= 73)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **BUN Value (mg/dL)** | **Sensitivity** | **Specificity** | **PPV** | **NPV** |
| **10** | 77% | 33% | 33% | 77% |
| **11** | 77% | 49% | 40% | 83% |
| **12** | 73% | 59% | 43% | 83% |
| **13** | 68% | 73% | 52% | 84% |
| **14** | 59% | 76% | 52% | 81% |
| **15** | 50% | 82% | 55% | 79% |
| **16** | 45% | 90% | 67% | 79% |
| **17** | 41% | 90% | 64% | 78% |
| **18** | 36% | 92% | 67% | 77% |
| **19** | 27% | 94% | 67% | 75% |
| **21** | 23% | 98% | 83% | 75% |
| **23** | 18% | 98% | 80% | 74% |
| **24** | 14% | 98% | 75% | 72% |
| **37** | 14% | 100% | 100% | 73% |

**B. Derived from the BUN Change Cohort (CHKD & CCHMC) data (n=176)**

|  |  |  |
| --- | --- | --- |
|  | **Admission** | **24-48 hours** |
| **BUN Value (mg/dL)** | **Sensitivity** | **Specificity** | **PPV** | **NPV** | **Sensitivity** | **Specificity** | **PPV** | **NPV** |
| **10** | 83% | 38% | 28% | 89% | 59% | 71% | 38% | 85% |
| **11** | 78% | 52% | 31% | 89% | 59% | 81% | 49% | 87% |
| **12** | 72% | 60% | 34% | 88% | 56% | 84% | 51% | 86% |
| **13** | 69% | 72% | 42% | 89% | 50% | 88% | 57% | 85% |
| **14** | 61% | 79% | 45% | 88% | 44% | 94% | 68% | 85% |
| **15** | 56% | 83% | 48% | 87% | 41% | 95% | 70% | 84% |
| **16** | 50% | 88% | 55% | 86% | 41% | 95% | 74% | 84% |
| **17** | 47% | 88% | 53% | 85% | 35% | 95% | 71% | 83% |
| **18** | 44% | 91% | 59% | 85% | 32% | 95% | 69% | 82% |
| **19** | 42% | 91% | 59% | 85% | 26% | 96% | 69% | 81% |
| **20** | 39% | 94% | 67% | 84% | 24% | 97% | 73% | 81% |
| **21** | 33% | 98% | 80% | 84% | 24% | 98% | 80% | 81% |
| **22** | 28% | 98% | 77% | 83% | 21% | 98% | 78% | 80% |
| **25** | 19% | 98% | 70% | 81% | 18% | 98% | 75% | 80% |
| **32** | 17% | 99% | 86% | 81% | NA | NA | NA | NA |

**Supplemental Figure 1.**

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