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**Background:** The incidence and potential causes of acute kidney injury (AKI) and the occurrence of postoperative thrombocytopenia have been previously well described.(1,2) In adult literature an association between thrombin generation, platelet and leukocyte activation during bypass and acute renal ischemic complications has been shown.(3) We investigate whether there is an association between the platelet nadir and the incidence of AKI.

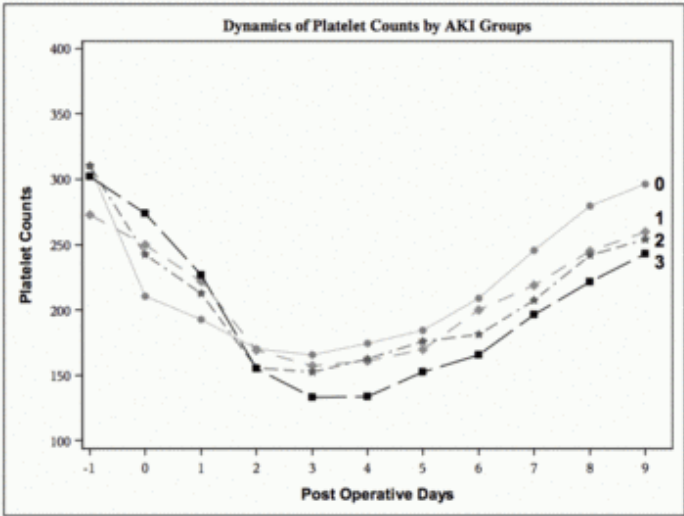
**Methods:** After IRB approval, a retrospective review was performed of the electronic medical records and the cardiac database from a single institution over a 5year period. All patients under 21 years of age undergoing cardiopulmonary bypass (CPB) were included in the study. Descriptive statistics were used to evaluate the characteristics of the creatinine and platelet distributions and ANOVA was used for any comparisons of unbalanced data among Acute Kidney Injury Network groups (AKIN). We describe the relationship and trends between creatinine and platelet count of all patients together and after stratifying them into groups defined by their renal injury categories.

**Results:** A total of 977 patients were included in the analysis with demographics represented in Table 1. The total incidence of AKI was 37% according to the AKIN criteria with the incidence of each AKIN group being: 1 (14%), 2 (17%) and 3 (6%). Figure 1 shows the AKIN groups and their platelet trajectories. The statistical differences are shown in the table with the most marked difference occurring between AKIN group 0 and 3. Table 2 depicts the association of the increasing incidence of platelet transfusion, and the decrease in platelet nadir, with an increased incidence of kidney injury.

**Conclusions:** Our data shows that there is an association between the development of AKI and the platelet nadir in each group. We plan to further analyze the data with multivariate analysis to determine if this decrease in platelet count represents an ongoing consumptive hypercoagulable process that further contributes to AKI in the postoperative period.

References

- 1. Clin J Am Soc Nephrol. Jan 2006;1(1):19-32.
- 2. J Am Soc Nephrol. Sep 2011;22(9):1737-1747.
- 3. Ann Thorac Surg. Mar 2003;75(3):899-905.



| Thrombocytopenia Compared in AKIN Groups (p values) |          |          |          |          |          |          |
|-----------------------------------------------------|----------|----------|----------|----------|----------|----------|
| Akin Groups:                                        |          |          |          |          |          |          |
|                                                     | 0 with 1 | 0 with 2 | 0 with 3 | 1 with 2 | 1 with 3 | 2 with 3 |
| Pre-operative                                       | 0.0006   | 0.9649   | 0.6070   | 0.0116   | 0.1275   | 0.6777   |
| POD 0                                               | <.0001   | 0.0002   | <.0001   | 0.5891   | 0.2428   | 0.0900   |
| POD 1                                               | 0.0004   | 0.0065   | 0.0025   | 0.4628   | 0.8089   | 0.3983   |
| POD 2                                               | 0.8597   | 0.0121   | 0.0982   | 0.1074   | 0.2617   | 0.9769   |
| POD 3                                               | 0.2758   | 0.0646   | 0.0008   | 0.6212   | 0.0321   | 0.0697   |
| POD 4                                               | 0.1547   | 0.1655   | 0.0003   | 0.8674   | 0.0500   | 0.0249   |
| POD 5                                               | 0.2147   | 0.4107   | 0.0135   | 0.6827   | 0.3180   | 0.1421   |
| POD 6                                               | 0.5200   | 0.0224   | 0.0028   | 0.2238   | 0.0523   | 0.3544   |
| POD 7                                               | 0.1123   | 0.0100   | 0.0066   | 0.5522   | 0.3221   | 0.5823   |
| POD 8                                               | 0.0741   | 0.0428   | 0.0108   | 0.8861   | 0.3946   | 0.4617   |
| POD 9                                               | 0.1158   | 0.0614   | 0.0451   | 0.8410   | 0.6085   | 0.7373   |

Figure 1: Platelet count is compared between AKIN Groups (0-3) on perioperative days (POD = post-operative). (0= no acute kidney injury; 1 = Creatinine >1.5X baseline; 2 = >2X baseline; 3 = >3X baseline). \*Represents statistically significant difference between values, p ≤ 0.05.

|              | TOTAL GROUP (n=977) | AKIN Groups       |                 |                 |                 |
|--------------|---------------------|-------------------|-----------------|-----------------|-----------------|
|              |                     | 0                 | 1               | 2               | 3               |
|              |                     | (n=617) 63%       | (n=134) 14%     | (n=164) 17%     | (n=60) 6%       |
| Gender (M:F) | 540:435 (55%:45%)   | 349:268 (56%:44%) | 77:57 (57%:43%) | 88:76 (54%:46%) | 26:34 (43%:57%) |
| Age (years)* | 3.3 ± 5.3           | 4.1 ± 5.7         | 2.7 ± 4.7       | 1.7 ± 4.2       | 0.7 ± 1.3       |
| Weight (kg)* | 16.6 ± 21.2         | 19.8 ± 23.0       | 14.1 ± 19.5     | 10.6 ± 16.2     | 6.6 ± 4.3       |
| Neonates (n) | 200 (21%)           | 83 (13%)          | 49 (37%)        | 46 (28%)        | 22 (37%)        |
| Infants (n)  | 391 (40%)           | 198 (32%)         | 67 (50%)        | 92 (56%)        | 34 (57%)        |

Table 1: Demographics . AKIN groups (0= no acute kidney injury; 1 = Creatinine >1.5X baseline; 2 = >2X baseline; 3 = >3X baseline). \*Data is presented as mean values with standard deviation.

|                                                      | TOTAL GROUP (n=977) | AKIN GROUP        |                   |                    |                    |
|------------------------------------------------------|---------------------|-------------------|-------------------|--------------------|--------------------|
|                                                      |                     | 0 (No AKI)        | 1                 | 2                  | 3                  |
|                                                      |                     | (n=617) 63%       | (n=134) 14%       | (n=164) 17%        | (n=60) 6%          |
| Preoperative creatinine (mg/dl)*                     | 0.46 ± 0.01         | 0.49 ± 0.01       | 0.49 ± 0.02       | 0.38 ± 0.02        | 0.32 ± 0.02        |
| Creatinine peak (mg/dl)* (% increase)                | 0.62 ± 0.01         | 0.58 ± 0.01 (16%) | 0.76 ± 0.03 (55%) | 0.73 ± 0.03 (195%) | 0.99 ± 0.05 (309%) |
| Patients with Intraop Platelet Transfusion (n)       | 625 (64%)           | 350 ( 57%)        | 98 (73%)          | 128 (78%)          | 49 (81%)           |
| Platelet Nadir (platelet count x10 <sup>9</sup> /L)* | 158 ± 3             | 165 ± 3.6         | 157 ± 6.8         | 152 ± 5.9          | 133 ± 8.2          |

Table 2: Results of the total group and separated by AKIN groups(0= no acute kidney injury; 1 = Creatinine >1.5X baseline; 2 = >2X baseline; 3 = >3X baseline) \* Data is represented as mean value with standard error.