Does the Effectiveness of Thymoglobulin as Measured by T-Cell Depletion Correlate with the Incidence of Acute Rejection Post Kidney Transplant?

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BACKGROUND

- Thymoglobulin® is one of two standards for immunosuppression induction agents for renal transplantation and is antibodies derived from rabbits against human T-cell markers including CD2 and CD3.
- CD2 and CD3 are different pan-T cell markers on cell surfaces, quantifiable by flow cytometry.
- T lymphocytes are the primary mediator in recognition of foreign antigen so their depletion post transplantation reduces acute cellular graft rejection.
- Grades of kidney graft rejection are defined using the Banff 2017 classification of antibody-mediated rejection (AMR) and acute-cell mediated rejection (ACR).

OBJECTIVE

- The purpose of this study was to evaluate the relationship between the effectiveness of Thymoglobulin® as measured by T lymphocyte depletion in preventing rejection.

METHODS

- A retrospective review of 425 kidney only transplant recipients from March 2012 to October 2017.
- From a complete transplant database the following data was extracted: date of transplant, transplant status, severity of rejection, CD2 and CD3 measurements from the first week and Ascending grades of rejection (Borderline, 1A, 2B, 2A, 2B).

RESULTS

- Mean CD2 and CD3 counts before Thymoglobulin® were 1258.5 ± 545.7 and 1162.0 ± 501.9 cells/mm³.
- The mean CD2 and CD3 counts after Thymoglobulin® were 10± 33.6 and 8± 22.5 in patients with no rejection (N=245) and 16 ± 65.6 and 15 ± 60.9 in patients with any level of rejection (N=180).
- No association between rejection grade and lymphocyte depletion.

OUTCOMES

Figure 1: Break down of worst pathology for each patient. Ascending grades of rejection represent increasing inflammation in the biopsy.

Figure 2: Patients with no rejection had lower mean CD2 and CD3 counts than patients with any type of rejection.

Figure 3: There was no relationship between mean CD2 or CD3 counts and each grade of rejection.

CONCLUSIONS

- Higher post treatment CD2 and CD3 counts are associated with increased risk of graft rejection in the first post-transplant year.
- CD2/CD3 counts are not associated with severity of rejection.
- Future studies should look into if additional Thymoglobulin® to lower CD2/CD3 counts in patients with higher counts would result in these patients having fewer rejections.

REFERENCES