



## Background

- The use of bio prosthesis for aortic valve surgery has increased in the last decade, partly due to the increased durability in newer generations of bio prosthesis and the future possibility of a TAVR. Early dysfunction with a possible immunologic origin has been previously described related to the development of Anti-gal specific antibodies (1,2).
- Since 2005 Konakci et al reported the **possible immunologic origins of early bio prosthesis failure associated with a xeno-antigen called Alfa-Gal ( $\alpha$ -Gal) (Gal alpha1,3-Gal beta1-4GlcNAc-R)**, which theoretically causes an hyperacute rejection response in primates with porcine xenotrasplants (2,3).

Table 1. Demographic Database, including surgical, echocardiographic and immunologic variables

|                                  | Mean     | Median   | SD       |
|----------------------------------|----------|----------|----------|
| Surgical                         |          |          |          |
| Euro_Score                       | .9740    | .7400    | .59080   |
| STS                              | .8830    | .5150    | .83718   |
| Extracorporeal Circulation (min) | 132.60   | 121.00   | 28.613   |
| Aortic Crossclamp (min)          | 102.70   | 98.50    | 17.199   |
| ICU stay                         | 1.70     | 2.00     | .675     |
| Total Admission                  | 4.10     | 3.00     | 1.912    |
| Follow up since implant (months) | 25.4850  | 23.7150  | 16.51527 |
| Echocardiographic data           |          |          |          |
| V Max AoV (m/s)                  | 2.6180   | 2.3900   | .50159   |
| Max Gradient (mm Hg)             | 28.3140  | 22.8350  | 11.05872 |
| AVAo ITV (cm2)                   | 52.8100  | 51.6000  | 12.49955 |
| Mean Gradient AV (mm Hg)         | 14.0070  | 12.2000  | 5.64620  |
| EF LV (%)                        | 63.70    | 63.50    | 8.460    |
| TAPSE                            | 21.60    | 20.50    | 3.596    |
| Global Strain (%)                | -20.9200 | -20.4500 | 2.26853  |
| AV acceleration (m/s)            | 75.50    | 79.50    | 15.981   |
| DVI                              | .6450    | .6250    | .12730   |
| Antibodies                       |          |          |          |
| IgE                              | .0210    | .0100    | .01969   |
| IgG                              | 3.8580   | 3.7700   | 1.33388  |

## METHODS

- We conducted a transversal observational trial, including our local population who underwent Surgical Valve Replacement with a bio prosthesis with RESILIA tissue through a MICS procedure.
- Our goal was to describe hemodynamic variables in follow-up transthoracic echocardiogram associated with Structural Valve Dysfunction and correlate this findings with a quantitative analysis of Immunoglobulin G and E Anti-Alfa Gal in patient's serum.
- For the descriptive Analysis we used IBM SPSS 22.0 (Chicago, IL, USA.). We also did Kendall Correlation analysis for independent variables with RStudio (2022) results were statistically significant when  $p < 0.05$ .

## Results

- Final database included 10 patients (70% male) with a mean age of 55.5 years old (22-72 SD 15.4), their initial diagnosis was Aortic Stenosis (6 patients), Regurgitation (2 patients) and Combined aortic and regurgitation (2 patients), as shown in Table 1.
- Patients underwent AVR through RAT with average implant size was 23.8 mm (21-27 mm) with mean extracorporeal time of 123.6 min (102-181 SD 28.6) and aortic cross clamp 102.7 min (79-131 SD 17.19 ). Results are presented in Table 1.
- In Kendall correlation analysis (Figure 1) of independent variables we observed a **positive correlation between Immunoglobulin G Anti-Alfa Gal with LV EF** ( $p = 0.03114$ ) and Tau value of Tau = 0.5393599, also there is a **tendency to negative correlation with prosthesis size**, although not statistically significant ( $p=0.07218$ ).
- **Immunoglobulin E Anti Alfa-Gal was positively correlated with two variables**, Max Velocity of aortic Valve ( $p= 0.5128$  Tau= 0.5318) and Max Gradient AV (  $p= 0.5207$  Tau = 0.5259) as shown in Figure 1.

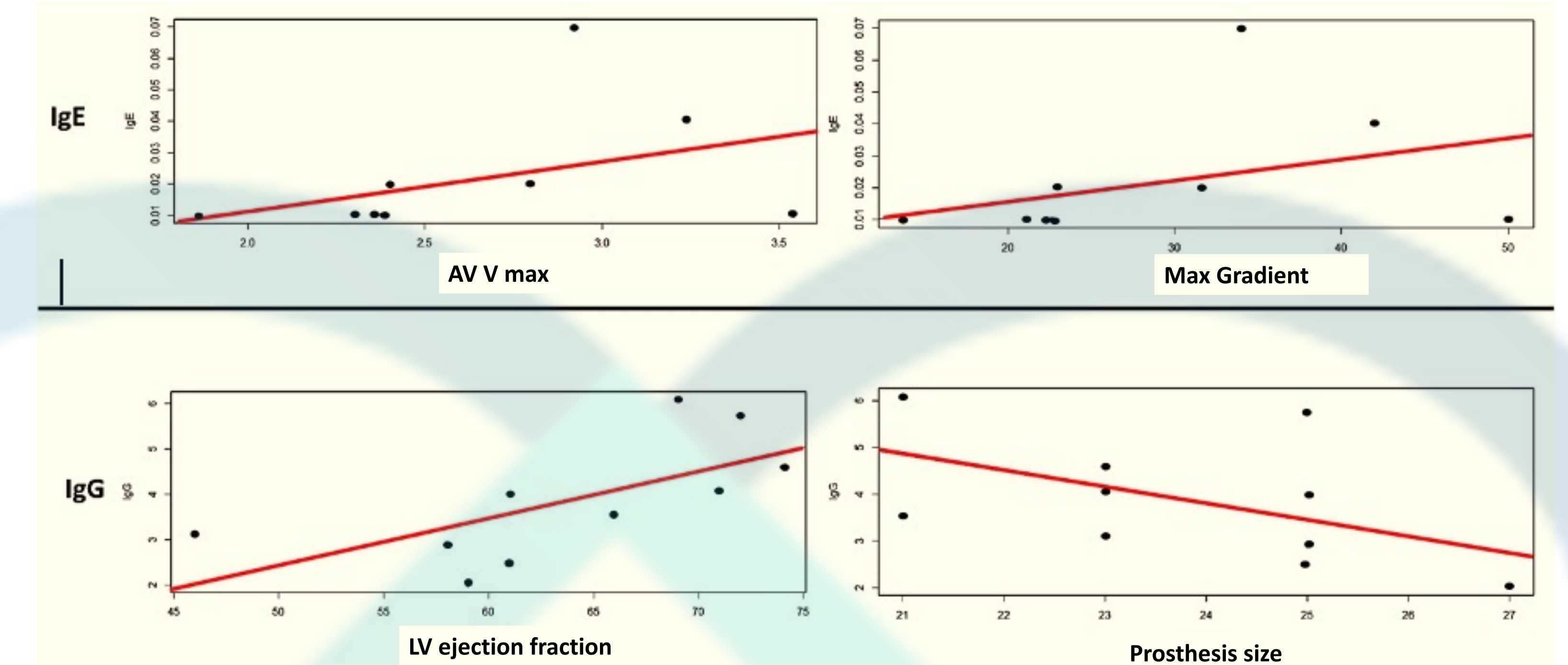


Figure 1 Kendall Correlation Analysis

## Discussion & Conclusions

- Safety and hemodynamic performance of the new technology bioprosthesis has been well described, with increasing follow-up and no signs of significant structural valve dysfunction (4,5). Traditional definition of Structural Valve Dysfunction might underestimate the actual population at risk (1,6).
- We described a small series of patients with presence of **immune response to a known xenoantigen related to porcine tissue**, as means to contribute to international literature in this **possible immunologic origin of early valvular dysfunction**.
- Although we found some interesting data, this is a small population and correlation could be related to a circumstantial effect of non-analyzed environmental factors, we aim to continue follow-up of this population and **in the future document the possible sero-conversion of this antibodies after bio prosthesis implant**. Future directions could include the **immunologic analysis to determine the optimal prosthesis** for each patient, and guide research and development of completely decellularize or synthetic prosthesis.