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Avila O[1], Almeida S H[2], Parizi N[2], Souza A P[2], Botini D[2], Alves J[2]
1. *Universidade do Oeste Paulista,* ***2.*** *Universidade Estadual de Londrina*

EFFECT OF PLATELET-RICH PLASMA IN POLYPROPYLENE MESH-INDUCED HISTOLOGICAL ALTERATIONS IN RABBITS

Hypothesis / aims of study:
The platelet-rich plasma is part of a set of biotechnologies developed for employment in tissue engineering, providing a number of growth factors that promote repair of different tissues [1]. The polypropylene meshes are applied in correction of abdominal wall defects, pelvic floor and urinary incontinence (SUI), however, they illustrate a number of significant complications, possibly the result of an inappropriate inflammatory response [2]. The aim of this study is to investigate the changes caused by PRP when associated with the implantation of polypropylene meshes in the abdominal female rabbits, in production of collagen type I and III, in the inflammatory infiltrate and in production of muscle tissue.

Study design, materials and methods
We performed abdominal implant meshes with and without PRP in adult rabbits (n = 30) and euthanasia at 7, 30 and 90 days. Two plates were prepared for each animal and analyzed in five different fields of each slide by each staining techniques. The inflammatory infiltrate was evaluated by quantification of inflammatory cells using hematoxylin - eosin, deposition of collagen by Sirius red method and trichrome Masson was used to evaluate muscular structures. The results were analyzed applying the Wilcoxon test, Kruskal- Wallis, Junckheere and Friedmann.

Results
There was a significant difference in the increase in the number of inflammatory cells between the groups with and without PRP (p = 0.01) at 90 days (Figure 1).

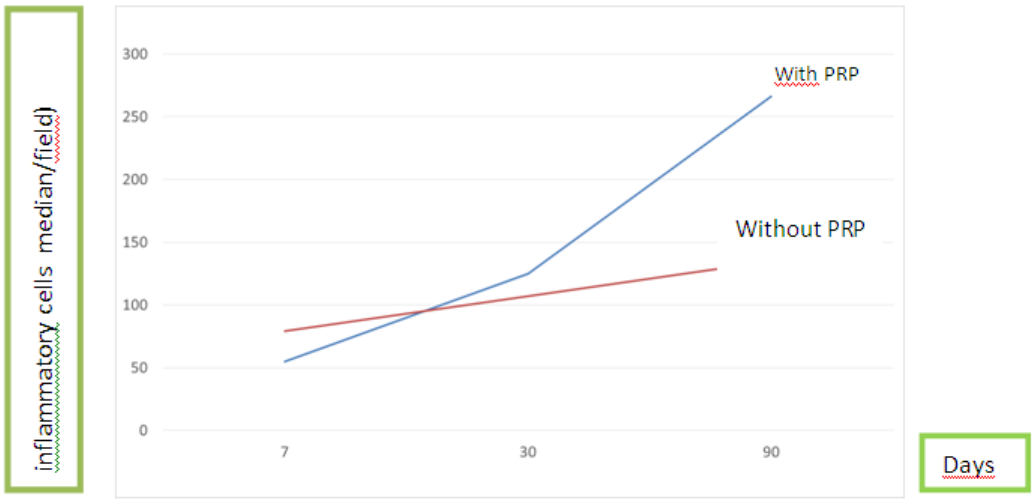
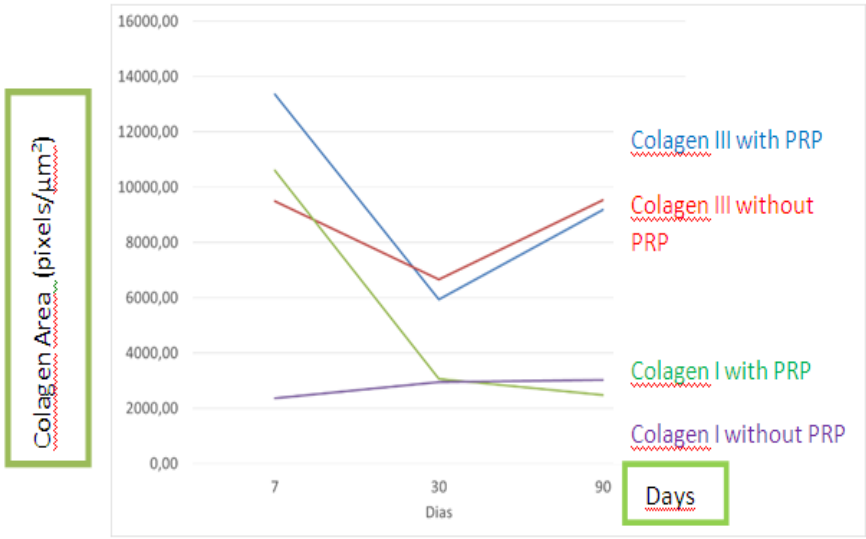


Figure demonstrating the number of inflammatory cells into the rabbits euthanized at 7, 30 and 90 per group , with or without PRP .

There were increased production of collagen type I and type III and complete with the use of PRP, at 7 days (figure 2). There was no change in the analysis of muscle structures.



Graphic in of the medians areas of collagen types I and III, for groups with and without PRP.

Interpretation of results

The results suggest that PRP increased the final inflammatory reaction and also changed the total collagen production at an early stage. This reflects a possible better incorporation of the graft to the host [3]. These reflections are evident when studying two variables together the concentration of inflammatory cells and collagen production. In an initial process when the intense inflammatory reaction can cause a rejection of the implant, the PRP has not changed this reaction, but when the concentration of inflammatory cells is necessary for the maintenance of chronic process to a final integration of the material, the PRP has a positive response, and concentration increased when compared with populations without PRP. Added to this, the fact of the total collagen production to meet increased early in the process, showing a possible acceleration of tissue repair process.

Concluding message

The polypropylene mesh coating with PRP was associated with increased leukocyte at the implant area, and an increase trend during the process of tissue repair. The polypropylene mesh coating with PRP was associated with increased concentration of collagen type I and collagen type III, the concentration of total collagen increased after 7 days of implantation.

References

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Disclosures

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