

## 4<sup>th</sup> International Conference & Exhibition on **Surgery**

October 05-07, 2015 Dubai, UAE

## Immunologic round: Titanium versus stainless steel

Sibel Akyol<sup>1</sup>, Hakan Bozkus<sup>2</sup> and Murat Hanci<sup>1</sup> <sup>1</sup>Istanbul University, Turkey <sup>2</sup>American Hospital, Turkey

**Purpose:** This study analyzes the cellular and humoral immunologic reactions that occur after the in vitro implantation of stainless steel (SS) alloy and titanium (Ti) alloy.

**Methods:** In the study, Wistar albino rats after an exploration of the thoraco-lumbar para-vertebral muscle tissue of the subjects, group I underwent a sham surgery and groups II and III were implanted Ti alloy and SS alloy rods respectively.

**Results:** CD4, CD25 (IL-2R) (lymphocyte and CD4 gate), CD4+CD8+ and CD4+CD25+Foxp3+ (Tregs) levels were lower in the SS alloy group compared to the sham and Ti alloy groups. IL-6, IL-17A, TGF- $\beta$  and TNF- $\alpha$  level in the SS alloy group showed a significant increase on all days in comparison with the sham and Ti alloy groups. IL-4 and IL-10 levels, on the other hand, were lower in the SS alloy group than those in the Ti alloy group; and a significant decrease was observed in the IL-10 level. While there was a reduction in IL-6 and IL-17A levels in the Ti alloy group as opposed to the sham group, no difference was observed in TNF- $\alpha$  level.

**Conclusions:** As opposed to SS alloy, Ti alloy suppresses the development of inflammations by inhibiting pro-inflammatory response; strengthens the humoral immune system by intensifying the antibody-dependent immune response; triggers the development of immune tolerance by regulating the immune response; and activates the mechanism that prevents immune response-related damage from occurring.

sibelakyol@gmail.com

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