Free Papers G

[O101] INTERNALIZATION OF PROPIONIBACTERIUM ACNES BY OSTEOBLASTS DEPENDS ON P. ACNES GENETIC BACKGROUND

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Aim: *Propionibacterium acnes* is an emerging pathogen especially in orthopedic implant infection. Interestingly, we previously reported a difference in the distribution of the clades involved in spine ***versus*** hip or knee prosthetic infection. To date, no study has previously explored the direct impact and close relationship of ***P. acnes*** on bone cells according to their own genetic background. The aim of this study was to investigate this interaction of ***P. acnes*** clinical strains involved in spine material infections, arthroplasty infections and acne lesions with bone cells.

Method: From a large collection of 88 ***P. acnes*** clinical isolates collected between January 2003 and December 2014, a subset of 11 isolates was studied. Four isolates were recovered from spine infections, two from prosthetic infections (knee and hip), three from acne lesions and two reference strains (ATCC11827 and ATCC6919). Implant-associated infections were confirmed according to Infectious Diseases Society of America guidelines for bone and joint infections. Multi-Locus Sequence Typing (MLST) was carried out on all isolates as described by Lomholt ***et al***. PLoS ONE 2010. Bacterial internalization experiments with MG63 osteosarcoma cells were adapted from Crémet et ***al.*** Pathog Dis 2015.

Results: Among the nine clinical isolates, three isolates belonged to clonal complexes (CCs) 18; three to CC28 and three to CC36. ATCC isolates belonged to CC18. Bacterial internalization experiments revealed that CC36 ***P. acnes*** strains were less invasive than CC18 and CC28 ***P. acnes*** strains towards osteoblasts (mean percentage of internalized bacteria (< 0.01% for the CC36 ***P. acnes*** strains ***versus*** more than 1% for the CC18 and CC28 ***P. acnes*** strains). Surprisingly, the ATCC11827 CC18 ***P. acnes*** strain exhibited invasiveness similar to CC36 isolates.

Conclusions: Evasion mechanism observed for CC36 P. acnes isolates could allow this clade to leave the site of infection, disseminate into deeper tissue layers and beget arthroplasty infection. Inside the deeper tissue, close to the material, the local immune defect fosters the low-grade infections observed with P. acnes clinical strains. On the another hand, for CC18 et CC28 clades, mostly involved in spine infection, the internalization process observed could allow these clades to escape from the numerous immune cells located under the skin and generate an infection locally, favored by the spine instrumentation close to the skin, especially during long spine surgeries.