

BEATING THE INFECTION - AT A NANO-LEVEL

Introduction

A biomedical product that surgeons use most frequently during surgeries is sutures. While sutures aid wound healing they also cause wound infection. Can we keep the beneficial effects of sutures and eliminate potential infection risk? A study was carried out in the labs to develop a biomaterial with superior properties that even overcomes the adverse effects of the regularly used silk sutures.

Materials & methods

We collaborated with departments of Biochemistry, Microbiology, KMC Mangalore and engineering departments of NITK- Surathkal and MIT Manipal to produce Silver Nanoparticle impregnated silk sutures, laboratory tested its antibacterial properties and assessed its physical properties to obtain a viable product.

Results

The silver impregnated silk sutures were fabricated at biochemistry lab and tested in the microbiology lab followed by mechanical testing. The silver coated sutures proved to be superior than the regularly used silk sutures in antibacterial properties with wound healing effect without any changes in its mechanical properties.

Discussion

The realm of nanotechnology may provide the solution to current problems. Silver is known to have antimicrobial properties. The aim of our research was to impregnate silver as nanoparticles (AgNP's) onto the widely available and inexpensive silk suture material to produce antimicrobial effects, aid wound healing, without altering physical properties of the silk suture. This may also result in a decreased requirement for post-operative medicated dressings.

References

- Franco AR, Fernandes EM, Rodrigues MT, Rodrigues FJ, Gomes ME, Leonor IB, Kaplan DL, Reis RL. Antimicrobial coating of spider silk to prevent bacterial attachment on silk surgical sutures. *Acta biomaterialia*. 2019 Nov 1;99:236-46.