Investigation of anti-microbial properties of chitosan-Tio_2 Nanocomposite and its use on sterile gauze pads

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Abstract

Background and objectives: In this research, the formation of chitosan-TiO2 nanocomposite and its antibacterial effect on Escherichia coli and staphylococcus aureus was investigated

Material and Methods: to study the results, we used Scanning electron microscopy (SEM) and transition electron microscopy (TEM) images, infrared (IR) spectroscopy and ultraviolet-visible. Optical Density (OD) was also measured by spectrophotometer; then the effect of this nano composite, in the vicinity of aforementioned bacteria, on the sterilized gauze in solid Muller Hinton Agar and TSB liquid mediums was assessed

Results: The mentioned nanocomposite was formed with the composition of 4mg/ml Chitosan concentration and 2% titanium dioxide concentration. Finally, we observed that this nanocomposite near 100% could prevent bacterial growth and in the presence of this material did not grow any bacteria.

Conclusion: chitosan-Tio2 Nanocomposite can be useful on culture medium and sterilized gauze to control pathologic bacteria.

Key words: nanocomposite, nanochitosan, titanium dioxide, antibacterial, sterilized gauze