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Title: Antimicrobial activity of Zinc oxide nano particles against multi drug resistant uropathogenic Escherichia coli

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Multi drug resistance (MDR) in uropathogenic E. coli (UPEC) causing urinary tract infections (UTIs) is an emerging and serious public health problem that has become one of the major global concerns. Contrary to the synthetic drugs, some inorganic nanoparticles (NPs) are not associated with many side effects and have a great therapeutic potential to treatment of infectious caused by resistant microbes. We aimed to study Zinc oxide nano particles (ZnO NPs) as an alternative antibacterial agent for controlling MDR UPEC. The study was carried out on 40 MDR UPEC isolates collected from patients admitted to Mansoura University Hospitals. The selected isolates were tested for the effect of different concentrations of ZnO NPs alone as an antibacterial agent and the combined effect of antibiotics and ZnO NPs as an antibacterial agent by the agar well diffusion method. Effect of ZnO NPs on UPEC isolates were confirmed by Transmission Electron Microscope. Of all used concentrations of ZnO NPs, the concentration (4.176 g/l) was the most active one with inhibition zones diameter ranged between (14-26 mm) and the second concentration (1.392 g/l) caused inhibition zones diameter ranged between (14-24mm), followed by (0.464, 0.154, 0.051, 0.017, 0.0057 g/l) respectively. The antibacterial activity of antibiotics such as meropenem, piperacillin tazobactam, cefepime, amoxicillin clavulanic acid, ciprofloxacin, gentamycin, amikacin, aztreonam, nitrofurantoin, sulfamethoxazole- trimethoprim, cefaclor, tetracycline and norfloxacin respectively against E. coli was increased considerably in the presence of ZnO NPs while the antibacterial activity of cefotaxime was not increased considerably in the presence of ZnO NPs. ZnO NPs were effective in controlling MDR UPEC isolates in vitro. Increasing the concentrations of ZnO NPs lead to more inhibition of UPEC growth. Further studies are recommended to study its efficacy in vivo.

Biography

Noha Tharwat Abou El-Khier graduated (Excellent with honors) from the Faculty of Medicine, Mansoura University (M.B.B. Ch.) in 1999. She completed her Ph.D. in Basic Medical Science (Medical Microbiology & Immunology) in 2011 from the Faculty of Medicine, Mansoura University. She worked as a Demonstrator, Assistant Lecturer, Lecturer Assistant Professor at Mansoura University. Currently, she is working as a professor in the department of Medical Microbiology and Immunology, Faculty of Medicine, Mansoura University. She is a member of the American Society of Microbiology (ASM), ESMM, Egyptian ESIC. She is a reviewer and editor in many microbiology Journals. She has published 38 papers in national and international journals. She collaborated in many conferences and workshops and symposia. She is the head of the Infection Control Team and a member of Infection Control Committee in Mansoura University Hospitals. Research interests: Medical Bacteriology; Molecular Biology; Infection control.