Cytotoxicity effect of nano-silibinin on drug resistant strains of pseudomonas aeroginosa and evaluation of mexA gene expression

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Abstract Introduction : Pseudomonas aeruginosa is a gram-negative opportunistic pathogene and is a common cause of nosocomial infections. silibinin as an herbal drug has anti-inflammatory and anti-cancer properties that nowadays researcher survey its antibacterial function. Aim of the study was to investigate the anti-bacterial potential of silibinin, against clinical isolates of Pseudomonas aeruginosa in combination with ciprofloxacin. Materials and methods: herein, we isolated 69 clinical strains of Pseudomonas aeruginosa patients in Guilan province. After determination of antibiogram by disc diffusion and MIC methods,26 ciprofloxacin (CP) resistant isolates were treated by ciprofloxacin only and in the combination with nano-particle encapsulated silibinin. Antimicrobial activity of nano- silibinin was assessed by MBC method. After RNA extraction and cDNA synthesis, mexA expression investigated in treated and untreated cells by nanoparticles silibinin and ciprofloxacin. Results:14 % of isolates were resistant to ciprofloxacin and the highest resistance for ciprofloxacin (CP) was determined in 1024 µg/ml. Our findings showed that a combined nano-silibinin and ciprofloxacin treatment reduced the bacterial counts below the lowest detectable limit after 24h. Also Q-RT-PCR analysis revealed that nano- silibinin led to down regulation of mexA, subsequently increase of ciprofloxacin efficiency in resistance isolates. Discussion: our results suggested that nano- silibinin could be inhibits bacterial growth through different mechanism such as mexA down regulation in combination with lower dose of ciprofloxacin (1/2 MIC). Keywords: Pseudomonas Aeruginosa, nano-Silibinin, Ciprofloxacin, MIC,mexA.

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