

## How far is the effect of Subminimal Inhibitory Concentration (Sub MIC) on virulence factors expressed by bacteria?

Nida'a M A Wadi<sup>1</sup>

<sup>1</sup> National University of Sciences and Technology "NUST", Oman



### Abstract

**A**ntibiotic medications are widely used in the treatment and prevention of various infections. An increase in the rate and extent of antibacterial action can be ranged over a wide of antimicrobial concentration but should be within minimum inhibitory concentration where this concentration represents the minimum effective of antibacterial agent (MIC). Sub inhibitory antimicrobial concentration (Sub MIC) may produce antibacterial effect. The major virulence factors associated with infections are the ability to adhere to tissue and initiates interaction of bacterial cell with tissue. It is potential in the pathogenesis of certain infectious disease. Agents interfering with the process of bacterial adhesion may have beneficial prophylactic or therapeutic effects. Many studies indicate that certain antibiotics affect bacterial adhesion at low concentrations. Sub inhibitory concentrations (Sub MIC) of some antibiotics may have an effect on bacterial structure and influence the adhesion of bacterial adhesion to epithelial cells. It has been observed that the pili play an important role in the attachment and an important prerequisite factor for the pathogenesis of the bacteria. Various antibiotics in Sub MIC concentrations markedly impair adhesion of *Streptococcus pyogenes* and *Escherichia coli* to human cells like loss of lipoteichoic acid that binds the organism to host cells. In this study certain characters of the isolated pathogen in vitro and the presence and absence of pili on the surface of the organism were studied. We utilized an in vitro assay system to study the effect of Sub MIC of various antibiotics on *Escherichia coli*. The results demonstrate that some antibiotics change the adhesiveness of *Escherichia coli* strains. Subminimum inhibitory concentration of various antibiotics showed the ability to reduce the colonization. Investigating the effects of Sub MIC antibiotics bacterial adhesion to epithelial cells may lead to the development of future antibiotic treatment modalities and may suggest a new parameter for the use and the study of antibacterial agents.

### Biography:

Nida'a Mohammed Ali Wadi is a Register Pharmacist for more than 30 years. She is a Sr. lecturer at Oman Medical College (currently named NUST, National University of Science and Technology). She has practiced as a Lecturer in Medical College and Sr. lecturer Pharmacy College for several years. She has many contributions as Speaker, Poster Presenter as well as published some articles. She teaches in the graduate pharmacy program different pharmacy subjects and she is Chairperson of training program for national and international training Coordinator with West Virginia Pharmacy College, USA & JSS India. Her interest of research is on antibiotic resistance (Beta Lactamases) and formulation and evaluation of local delivery system.

### Speaker Publications:

1. Gorman S P, McCafferty D F, Woolfson A D and Jones D S; "Electron and light microscopic observations of bacterial cell surface effects due to taurolidine treatment"; Letters in applied microbiology/ (1987) 4(5):103-109.
2. Braga P C and Piatti G; "Sub-minimum inhibitory concentrations of ceftibuten reduce adherence of *Escherichia coli* to human cells and induces formation of long filaments". Microbiology and immunology/ (1993) 37(3):175-179.
3. Ngwai Y B, Ibrahim K and Ijele I G; "Adherence of *Escherichia coli* to urinary catheter is a function of time, temperature and cell physiology". Journal of Phytomedicine and Therapeutics/ (2005) 10:1.
4. Jahanshahi M, Azad S, Aslanbeigi B and Rahbar M; "Effects of subinhibitory concentrations of antibiotics and antibodies on the adherence of *Escherichia coli* to human uroepithelial cells in vitro". Research Journal of Biological Sciences (2010) 5(4):326-329.
5. Wojnicz D and Tichaczek-Goska D; "Effect of sub-minimum inhibitory concentrations of ciprofloxacin, amikacin and colistin on biofilm formation and virulence factors of *Escherichia coli* planktonic and biofilm forms isolated from human urine"; Brazilian Journal of Microbiology/ (2013) 44(1):259-265.

[7<sup>th</sup> World Congress and Exhibition on Antibiotics and Antibiotic Resistance](#); London, UK- March 16-17, 2020.



**Abstract Citation:**

Nida'a M A Wadi, How far is the effect of Subminimal Inhibitory Concentration (Sub MIC) on virulence factors expressed by bacteria?, Antibiotics 2020, 7<sup>th</sup> World Congress and Exhibition on Antibiotics and Antibiotic Resistance; London, UK- March 16-17, 2020. (<https://antibiotics.pharmaceuticalconferences.com/abstract/2020/how-far-is-the-effect-of-subminimal-inhibitory-concentration-sub-mic-on-virulence-factors-expressed-by-bacteria>)