Effectiveness of laser radiance on Morganella morganaii secluded from malignant tumors (cancer)

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Irradiation, Cancer And Bacterial Tumors

ABSTRACT
Objective: The aim of this research to affect study radiation emitted from Nd: YAG laser on Morganella morgana isolated from malignant tumors. Study design: Case –Control study design in Analytical study design by 15 isolates from malignant tumors compared with 15 isolates from normal person. Cross-Sectional study design in descriptive study design for 30 isolates. Backrgound: Morganella morganii is a fermissive anaerobic rod Gram-negative enteric bacterium that was headmost isolated in 1906 via Morgan et al. of a pediatric fecal culture. Cancer evolution is the result of a spectrum of genetic modifications that change the normal control of cell expansion and survival. These genetic modifications can be enhanced by a wide diversity of external factors inclusive smoking, alcohol and sunlight. Methodology: Morganella morganii implanted in Nutrient broth at 37° C for 24 h and rapprochement with MacCfrland 0.5, subsequently exposing 1 ml of suspension to Nd:YAG laser with comparison of control group (without exposure to radiance), each run was done in triplicate and inoculated in Trypton soy agar. Results: Results the collection from sample are 15 isolates of Morganella morganii from patient malignant tumors and 15 isolates from healthy human. The results in this research proved a high rate of killing of bacteria Morganella morganii isolated from malignant tumors after exposure to Nd:YAG laser during 500 pulses per second and the number of live cells was few after exposure to the laser at different times and the more time the higher the killing rate compared to the control of samples not exposed to the laser as well as with repeaters and that. The use of Nd:YAG laser is secure, as it is utilized in cosmetics and there are no side impacts, so the competence of killing Morganella morganii secluded of cancer utilizing secure laser with high competence is very significant and it is an substantial application for treatment. Conclusion: The use of laser is safe as it is used in cosmetics and there are no side effects, and thus the efficiency of killing bacteria isolated from cancer using a safe laser with high efficiency is very important and it is an important application for treatment.

1. Introduction

Morganella morganii is a permissive anaerobic rod Gram-negative enteric bacterium that was headmost isolated in 1906 via Morgan *et al*. of a pediatric fecal culture [1]. The genome extent of *M. morganii* is about 4,000,000 bp and the numeral of its protein coding sequences (CDSs) is around 4,000 [2]. *M. morganii* was previously classified as *Proteus morganii* and subsequent assigned to the genus Morganella that belongs to the Proteeae of the Enterobacteriaceae family on the rule of DNA–DNA hybridization determinations [3, 4]. *M. morganii* is a motile, non-lactose fermenting bacterium that participate with the Proteus members on the ability irulence is a primitive merit for a pathogen. Genome sequence appeared that the virulence agents of *M. morganii* inclusive fimbrial adhesins, LPS, IgA protease, hemolysins, ureases and insecticidal and apoptotic toxins, as well as proteins found in flagella, iron procuration system, type-III excretion system (T3SS) and two composition systems (TCSs) [5]. Cancer evolution is the result of a spectrum of genetic modifications that change the normal control of cell expansion and survival. These genetic modifications can be enhanced by a wide diversity of external factors [6] inclusive smolder, alcohol and sunlight [7,8]. At least 75% of the apex and choke cancers are due to via tobacco and alcohol and 65–86% of the lacing cancer risk may be reffered to sun exposition [9]. In addition to these exterior factors, viral genomes have been restored from a diversity of tumour samples and this connect has been morever substantiated via numerous epidemiological treatise [10]. Radiance is the resurrection or transportation from power in the compose from waves or mote during space or during a substance median [11, 12]. This inclusive electromagnetic radiation for instance radio undulation, microwaves, infrared, visible lighting, ultraviolet, x-rays and gamma radiance (γ), mote radiance for instance alpha radiance (α), beta radiance (β), proton radiance and neutron radiance (motes of non-zero rest power), vocal radiance for instance ultrasound, sound and seismic undulation (conditional on a physical transportation median), gravitational radiance that picks the form of gravitational

undulations or ripples in the drooping of space time. Gamma rays, X-rays and the rise power area of ultraviolet light comprise the ionizing portion of the electromagnetic vision. The term "ionize" indicate to the fraction of one or further electrons onward of an atom, an influence that request the comparatively rise power that these electromagnetic undulations provide. Moreover minimal the phantom, the non-ionizing lower power of the lower ultraviolet phantom may not ionize atoms, however, may damage the inter-atomic bonds that form molecules, herewith fracturing minimum molecules partly than atoms, a good model of this is sunburn due to via long-wavelength helical ultraviolet. The undulation of extended wavelength than UV in visible light, infrared and microwave hesitation cannot fracture bonds but may reason oscillation in the bonds that are sensed as temperature. Radio wavelengths and beneath commonly are not served as hurtful to biological order. These are not severe delineations of the power, there is several superposition in the impacts from certain hesitation [13]. Cancer is a set of diseases inclusive abnormal cell growth with the potency to pervade or spread to another parts of the body[14]. These disparity with benign tumors that do not prevalence [15]. Possible indication and symptoms inclusive a lump, abnormal bleeding, provided cough, unexplained weight forfeiture and alter in bowel motion [16].

2. Methodology

Study design

Case- Control study design depending in this research for analytical study design and Cross-Sectional study desin for descriptive study design.

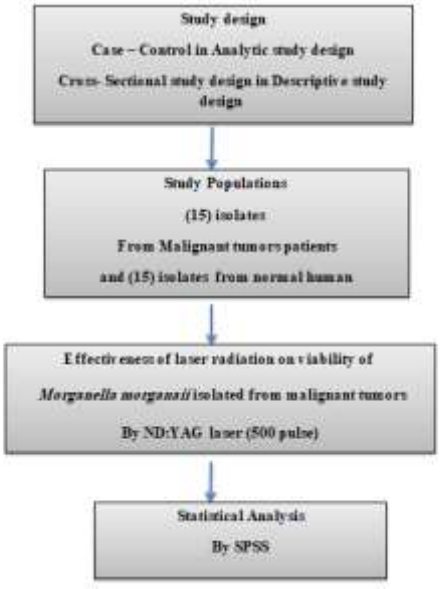

Figure (10): Scheme of study design of this research.

Study populations and Bacterial isolates

A total of summation of sample *Morganella morganii* strain were raised of malignant tumors from patients who were admitted in Baghdad infirmary in 2022 that identification via conventional biochemical responses depending to [17].

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Effect of Nd:YAG laser on *Morganella morganii*

Morganella morganii implanted was accomplished depending to[18] with several alterations, implanted in Nutrient broth at 37° C for 24 h , then centrifuged at 5000 rpm till 10 minutes. The pellet was suspended of sterile normal saline and rapprochement with MacCfrland 0.5, subsequently

exposition 1 ml of suspension to Nd:YAG laser with comparison of control group (without exposure to radiance), each run was done in triplicate and injected in Trypton soy agar .

The neutralization of proportion of assassination:

$$\text{Proportion of assassination \%} = \frac{\text{Control} - \text{treated}}{\text{Control}} * 100$$

3. Results and Discussions

Study design

Case –Control study design in Analytical study design by 15 isolates from malignant tumors compared with 15 isolates from normal person. Cross-Sectional study design in descriptive study design for 30 isolates.

Study populations and bacterial isolates

Outcomes of combination of sample are 15 isolates of *Morganella morganii* of patient malignant tumors and 15 isolates from healthy human.

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Impact of Nd:YAG laser on *Morganella morganii*

Morganella morganii exhibition to Nd:YAG laser in wavelength1064A° in 500 pulse amidst each pulse 6 second with triplicate. Outcomes revealing of Nd:YAG laser on viability were enumerated was become fewer than control (without exposure till laser and radiance) with high percentage of killing. Nd:YAG laser radiance were effective for assassination *Morganella morganii* impedance colstin that reason many infection to human and can be reason death. The insinuation of *Morganella morganii* to Nd: YAG laser in 500 pulse, in wavelength 1.06 nm the viability of those cells specified utilizing count of colony in table (1).

Table (1): Proportion of assassination and viability of Nd:YAG laser on *Morganella morganii*

Nd :YAG laser (500 pulse)		
No.	**Applicable cell**	**Proportion of assassination**
M1	**10**	**96%**
M2	**30**	**88 %**
M3	**40**	**84 %**
Wavelength = 1.06 nm		**control = 250 colony**

Figure (2): Nd:YAG laser apparatus that regenerate 500 pulse per second.

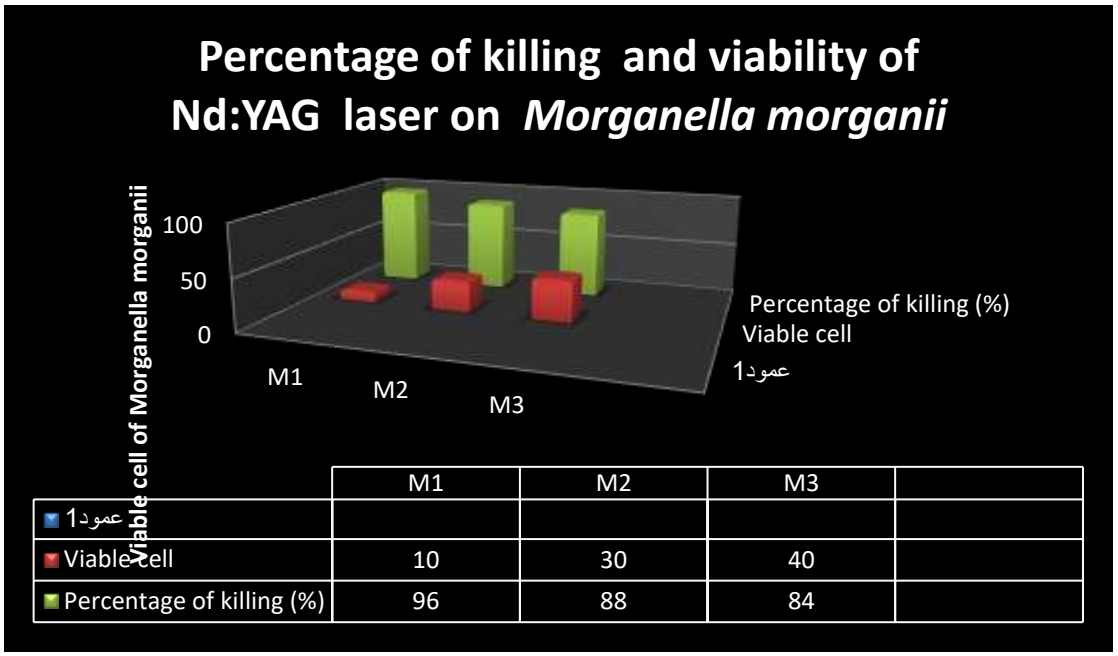

Figure (3): Percentage of killing and viability of Nd:YAG laser on *Morganella morganii*

The results in this research proved in Table (1) and figure (2), (3) a high rate of killing of bacteria *Morganella morganii* isolated from malignant tumors after exposure to radiation emitted by the Nd:YAG laser during 500 pulses per second and the number of live cells was few after exposure to the laser at different times and the more time the higher the killing rate compared to the control of samples not exposed to the laser as well as with repeaters and that. The use of Nd:YAG laser is secure, as it is utilized in cosmetics and there are no side impacts, so the competence of killing *Morganella morganii* secluded of cancer utilizing secure laser with high competence is very significant and it is an substantial application for treatment. A previous study by [19] approve results of impact or validation of semiconductor laser radiance on MDR *A. baumani* of headmost dilution with viable 95 cells in 10 min,12 cells in 20 min and 48 cell in 30 min, rapprochement control=400 cell, the proportion of assassination was extremely and the viable cells was less than control.

Outcomes validation efficient of semiconductor laser radiance on MDR *A. baumanii* of second dilution with viable 96 cells in 10 min,10 cells in 20 min and 40 cell in 30 min, rapprochement control=400 cell, the proportion of assassination was extremely and the viable cells was less than control.

4. Conclusions

1-There are elevation number of *Moranella moganii* isolated from malignant tumors.

2- Effectiveness of Nd:YAG laser have high efficiency for killing *Morganella morganii* isolated from malignant tumors per second with 500 pulse emitted from this laser radiation.

3- The use of laser is safe as it is used in cosmetics and there are no side effects, and thus the efficiency of killing bacteria isolated from cancer using a safe laser with high efficiency is very important and it is an important application for treatment.

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Researcher Dr. Nebras Rada Mohammed Ph.D. in Biotechnology with a Genetic Engineering, Molecular Genetics and Protein Engineering, a scientist, expert, researcher, creator, inventor, writer, written and author, editor-in-chief of the Journal of Articles and Inventions in the American Goidi Journal, teaching, lecturer at the University College of Al-Turath University college, a Bachelor's degree in Microbiology and a Master's degree in Molecular Biology in Microbiology from Al-Mustansiriya University, an arbitrator, international resident and consultant In medical laboratories, an expert in medical laboratories and a holder of the title of a scientist project, an arbitrator, a distinguished publisher, a silver supporter of scientific platforms, a chairman of a committee in a scientific society, receiving accolades from international intellectual property, the Best Arab Woman Award 2020, also the Best Community Personality Award, the Best Research Award 2019, also the Best Research Award 2020 and an American Award For the invention of 2020 by the American Goidi the World Investment Commission in America, holds the title of the best distinguished inventor in the world by the World Investment Commission in America and holds the first places in the world for inventions presented in the world from the American Goidi, the world investment commission in America.

Reference

[1] Morgan HR. (1907). Upon the bacteriology of the summer diarrhoea of infants. Br Med J., 2:908–12.

[2] Olaitan AO, Diene SM, Gupta SK, Adler A, Assous MV, Rolain JM. (2014). Genome analysis of NDM-1 producing Morganella morganii clinical isolate. Expert Rev Anti Infect Ther., 12:1297–305.

[3] Fulton M. (1943). The identity of bacterium columbensis castellani. J Bacteriol. 46:79–82.

[4] Brenner DJ, Farmer III JJ, Fanning GR, Steigerwalt AG, Klykken P, Wathen HG. (1978). Deoxyribonucleic acid relatedness of Proteus and Providencia species. Int J Syst Bacteriol. 28:269–82.

[5] Vanyushin BF. (2007). A view of an elemental naturalist at the DNA world (base composition, sequences, methylation). Biochemistry (Mosc). 72:1289–98.

[6] 6.Wu S, Powers S, Zhu W, Hannun YA (2015) Substantial contribution of extrinsic risk factors to cancer development. Nature 529: 43.

[7] Siegel RL, Jacobs EJ, Newton CC, Feskanich D, Freedman ND, Prentice RL, Jemal A (2015). Deaths due to cigarette smoking for 12 smoking-related cancers in the United States. JAMA Intern Med 175: 1574–1576.

[8] Koh HK, Geller AC, Miller DR, Grossbart TA, Lew RA (1996) Prevention and early detection strategies for melanoma and skin cancer. Current status. Arch Dermatol 132: 436–443.

[9] Parkin DM, Mesher D, Sasieni P (2011) 13. Cancers attributable to solar (ultraviolet) radiation exposure in the UK in

2010. Br J Cancer 105(Suppl 2): S66–S69.

[10] Blot WJ, McLaughlin JK, Winn DM, Austin DF, Greenberg RS, Preston-Martin S, Bernstein L, Schoenberg JB, Stemhagen A, Fraumeni JF Jr (1988) Smoking and drinking in relation to oral and pharyngeal cancer. Can Res 48: 3282–3287.

[11] Weisstein, Eric W. "Radiation". (2014). Eric Weisstein's World of Physics. Wolfram Research..

[12] "Radiation". (2014). The free dictionary by Farlex. Farlex, Inc.

[13] "The Electromagnetic Spectrum". (2018). Centers for Disease Control and Prevention.

[14] 14."Cancer". (2018). World Health Organization.

[15] 15. "Defining Cancer". (207). National Cancer Institute.

[16] 16."Cancer – Signs and symptoms". (2014). NHS Choices.

[17] 17-Forbes,B.A.;Sahm,D.F. and Weissfeld, A.S.(2007). Baily and Scott's Diagnostic Microbiology.11thedition. Mosby, Inc. Baltimore, USA. 384-398.

[18] 18-Ismail , M.C.H.; Waleed , S.; Jabbar , F. and Ibrahim, K. (2012). Effect of Diode Lazer (805) nm on alpha –toxin production and antibiotic sensitivity of Staphylococcus aureus . Iraqi J. Sci Vol 53. No. 2. Pp 755-759 .

[19] 19- Mohammed, N. R.; Jawad, J. J.; Salih, H. S. and Mahdi, K. H. (2020). Validation efficiency of laser radiation on Multidrug resistance Acinetobacter baumanii isolated from malignant tumors. Journal of AL-Turath University. Vol. 2 : (30). ISSN: 2074- 5621.