Growth Dynamics and drug Resistance Pattern of Methicillin Resistant *Staphylococcus aureus* under the effect of Panchgavya: Possible Next Generation Cost Effective Natural Drug.

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ABSTRACT:

Acquisition of drug resistance for major β-lactam antibiotics has worsened the problems of managing MRSA outbreaks. Hence need of a cost effective natural antibiotic with nil drug resistance induction potential is required. We have checked the growth dynamics and patterns of drug resistance of the two strains of MRSA (HA MRSA (D+ve) and CA-MRSA (SCC mec IV)) under the effect of Panchgavya (An ayurvedic solution, which is prepared by mixing 5 ingredients obtained from local breed of cow). Growth parameters were assessed by fitting growth models to turbidity growth curves or to detection times of serially diluted cultures either directly or by using Anlaysis of Variance (ANOVA) approach. Resistance profile against β-lactam drugs and hemolysin production was determined by kirby bauer disc diffusion method and culturing the strain on blood agar (for Hemolysis). Both sets were tested against the control sets of CA and HA MRSA (ATCC). It was interesting to observe that in comparison to the river water, growth of CA-MRSA was substantially ceased in panchgavya. Bacteriostatic activities of panchgavya was reported as there was minimal increase in CFU/ml of both the MRSA strains even after 24 hrs of incubation. Production of haemolysin was delayed in panchgavya treated strains by 30 hrs approximately. A marginal 1-2 mm of inhibition zone was observed in CA MRSA which was only visible in 2 out of 5 sets and hence hypothesis of drug resistance reversal couldn't establish. We thus support the theory that panchgavya apparently interfere in the growth dynamic of both strain of MRSA (HA& CA) by elongating the lag phase. Further molecular studies to check the Scc mec gene expression pattern under panchgavya stress is underway to give a clear picture of mode of action of panchgavya.

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Bibliography

Dr. Anup Kainthola has his expertise in the field of Medical Microbiology and Immunology. He worked on antibiotic resistance pattern of CA MRSA during his doctoral work and on radiation mediated damages to gastrointestinal tract and translocation of microbes thereafter at Defense Research &Development Organization, India. Out of his passion for natural drugs and antibiotic resistance burden, he successfully demonstrated the activity of panchgavya against drug resistant bacteria. His aim now is to provide molecular grounds to support his theory so as to attract industry players to take panchgavya as final answer to antibiotic resistance.

