



Comparative Study & Efficacy of Commonly Used Disinfectant against Human Pathogens

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Abstract— Disinfection is the process of elimination of virtually all pathogenic organism on inanimate objects & surfaces thereby reducing the level of microbial contamination to safe level. The study aimed to evaluate sensitivity of some clinical organisms used for the tests are *S. aureus*, *Klebsiella*, *Pseudomonas*, *E. coli*, *Bacillus* with the activity of some selected commercial disinfectants used are Dettol, Lysol, Ultraclean, Phenyl & Phenol. All the disinfectants used in this study have bactericidal effect against the test organisms whereas Phenol Coefficient test was carried out to compare sensitivity of disinfectants to that of phenol under experimental method so as to determine the disinfectant efficacy. Phenol & Dettol showed highest antimicrobial activity against all test organisms. Ultraclean also showed high antimicrobial activity except *Pseudomonas aeruginosa*. Phenol coefficient test was used for *Staphylococcus* appear as Lysol is the most potent disinfectant than all other disinfectant and for *Bacillus* appear as Dettol is more effective than other disinfectant used in this study.

Keywords— Disinfectants, Kirby-Bauer method, *S. aureus*, *Klebsiella*, *Pseudomonas*, *E. coli*, *Bacillus*, Phenol coefficient test.

I. INTRODUCTION

Disinfection procedures are typically used the most kind of intervention in hospital settings against potentially pathogenic microorganisms [1, 2] and aim to reduce complications due to infectious organisms. Disinfectants are usually utilized in hospitals and different health care settings for variety of topical and hard surface applications [3]. The main objective of disinfection is to manage and control the spread of infectious diseases. According to [4] disinfectants are chemicals used to inhibit or prevent the growth of microorganisms on inanimate objects. They are usually are "cidal" in action, killing susceptible potential pathogenic microbes. The majority of disinfectants can either be bacteriostatic or bactericidal [5]. Many parameters include concentration, time of action, pH, temperature as well as phenol concentration influence disinfectant effectiveness [6]. Depending on their effectiveness against vegetative bacteria, tubercle bacilli, fungal spores, enveloped and non-enveloped viruses, and bacterial spores, several disinfectants are available [7]. Out of many disinfectants, Savlon, Dettol, Lysol, Phenol, Alcohol, and Betadine are just a few of the disinfectants that are both cost-efficient and effective in removing practically all pollutants. However, as a result of environmental changes and mutations in the genomic structure of microorganisms, they are becoming increasingly resistant to current disinfectants, necessitating the search for fresh disinfectants. Their resistance to various antimicrobial substances can compromise patients'

therapeutic protocol [8], necessitating improved cleaning methods in healthcare environments [9,10]. Disinfectants are typically employed in dilutions, but it has been demonstrated that when some of these agents are diluted for usage, Gram negative bacteria such as *Pseudomonas aeruginosa* can survive, making them ineffective against nosocomial infection [11,12]. Infection control and patient treatment are both being hampered by the rise of resistant microbes in hospitals and the community. Methicillin-resistant *Staphylococcus aureus*, glycopeptide-resistant enterococci, and *Klebsiella pneumoniae* producing extended range beta-lactamase are among the organisms of particular concern. All of these pathogens are passed from patient to patient on the hands of the caregivers [13]. A recent large review of antibiotic resistance stressed the necessity of hospital infection control and the control of these organisms, and many authorities have emphasised the key role of hand washing with disinfectants [14]. The range of organisms controlled and the manner by which these agents perform vary greatly. Some puncture the microorganisms' cell walls, enabling the contents to flow out, while others permeate and enter the cell, killing the microorganism from within [15]. The goal of this study was to determine the phenol coefficient test and examine the antibacterial activity of various common disinfectant brands that were employed in this study, such as Dettol, Lysol, Ultraclean, and Phenyl, against all test organisms.