Antibiotics 2019: Antimicrobial resistance-mediated complications in wound infections in Accra, Ghana - Gershon Y. S. Sekley - G2 Medical Laboratory

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Background: Wound infection is a major global health problem because it poses serious complications that result in difficulty in treatment and wounds bacterial contamination are common hospital acquired infections causing more than 80% of mortality. The aim of this study was to identify common bacteria infecting five different types of wounds and their resistance to commonly used antibiotics.

The emergence of multidrug-resistant *Gram-negative* bacteria is a major concern in hospital settings in many parts of the world. Infections caused by these pathogens have become significantly challenging over the past two decades, particularly in the developing countries, and are associated with high morbidity and mortality rates as well as protracted hospital stay. Enterobacteriaceae including *Klebsiella pneumonia*, *Escherichia coli* as well as Enterobacter spp. and non-lactose fermenting bacteria such as *Pseudomonas aeruginosa* and *Acinetobacter* spp. have been identified as major cause of multi-drug resistant bacterial infections.

Studies conducted in many developing countries including Africa, have indicated high antibiotic resistance among Gram-negative bacteria to commonly used antibiotics, leading to a loss of efficacy for treatment of common infections. These resistant bacterial pathogens are a major cause of both community and hospital-acquired infections. Respiratory tract, urinary tract, bloodstream (septic), post-surgical (wound) infections and pneumonia are among most commonly reported infections attributable to these pathogens in many hospitals.

In spite of the fact that, the effect of anti-microbial obstruction brought about by multidrug safe Gram-negative microscopic organisms has been perceived in emergency clinics in Ghana, measures, for example, observation contemplates that give solid information to alleviate the issue are not set up. In this way studies to build up the commonness and degree of opposition are important to connect the data hole and give the premise to direct empiric treatment. The information further gives a pattern to future relative examinations.

Although, the impact of antibiotic resistance caused by multidrug resistant Gram-negative bacteria has been recognized in hospitals in Ghana, measures such as surveillance studies that provide reliable data to mitigate the problem are not in place. Therefore studies to establish the prevalence and extent of resistance are necessary to bridge the information gap and provide the basis to guide empiric therapy.

Methodology: Clinical swabs were received from hospitals and/ or clinics and some were obtained directly from patients visiting the G2 Medical Laboratory from 2015 to 2018. Specimens were obtained from wounds including Buruli ulcer, lupus, surgical, diabetes and burns. Conversional method of culturing on CLED, BLOOD AND CHOCLATE AGAR, incubated in an aerobic and anaerobic condition between 18 and 24 hours at 37°C. The microbial were identified through the gram staining and various biochemical reactions. Antibiotics sensitivity test was done for both gram negative and positive microbial.

Results: A total of 10629 specimen were analyzed and different types of bacteria were isolated, Pseudomonas aeruginosa was the most predominant pathogen isolated from all wound type infection: Buruli ulcer =3493 (32.9%); lupus =2180 (20.5%); surgical =2911 (27.4%); diabetes =1503 (14.1%); and burn =609 (5.7%). A total of microbial resistance n=9657. P. aeruginosa showed the highest rate of resistance to the tested antibiotics of n=5396 (55.9%): Gentamicin=963 (17.8%); amikacin=960 (17.8%); cefotaxime=813 (15.1%), ceftriaxone=850 (15.8%); ciprofloxacin=947 (17.6%) and levofloxacin=863 (16.0%) and other multidrug resistance strains identified were Enterobacter spp., n=2105 (21.8%); S. aureus, n=974 (10.1%); Klebsiella spp., n=571 (5.9%); Proteus spp., n=356 (3.7%) and E. coli, n=255 (2.6%).

Conclusion: Among other pathogens, we found P. aeruginosa to be the predominant bacteria in all wound infections and also shows the highest resistance to all tested antibiotics. A fugal elements (*Aspergillius* there was also isolated but no susceptibility testing was done). This study indicates that wound infections are typically polymicrobial comprising both Gram negative and positive bacterial with increased multidrug resistance to commonly used antibiotics for treatment.