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Antibiotic resistance profile among gram-negative bacterial pathogens from a teaching hospital in Ghana

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Infections caused by antibiotic resistant gram-negative bacteria have become a major challenge to healthcare delivery in Ghana. Production of beta-lactamase mediated-hydrolytic enzymes such as extended spectrum beta lactamases (ESBLs) or combined with other mechanisms confers resistant to beta-lactam antibiotics (penicillins, cephalosporins and carbapenems) as well as non-beta-lactams in gram-negative bacteria. The study aimed to assess the prevalence of antibiotic resistance among gram-negative bacteria in the Komfo Anokye Teaching Hospital in the Ashanti region of Ghana. Bacterial cultures were collected and identified using standard microbiological techniques and Vitek-2 automated systems. Of 200 isolates collected, 192 (96%) showed resistant to multiple antibiotics classes tested. The isolates (*Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Enterobacter spp*, *E. coli*, *Citrobacter koseri*, *Pantoea spp*, *Serratia marcescens*, *Providencia rettgeri* and *Sphingomonas paucimobilis*) showed high resistance to ampicillin (95%), trimethoprim/sulfamethoxazole (84%), cefuroxime/axetil (82%), cefuroxime (81%), cefotaxime (73.5%), amoxicillin/clavulanic acid (52.50), ciprofloxacin (41.0%) and piperacillin- tazobactam (13.00%), but highly sensitive to ertapenem (98.48%), meropenem (96.98%), imipenem (96.5%), amikacin (87%) and colistin (81.9%). The high resistance to beta-lactam/beta-lactamases inhibitor combination antibiotic therapy and aminoglycosides and fluoroquinolones, poses serious healthcare threat in Ghana, due to their use as an empirical antibiotic of choice for treatment of common infections. This study revealed a high prevalence of multidrug resistant pathogens in Komfo Anokye Teaching Hospital, is rife and a wakeup call for constant review of antibiotic guideline protocol for treatment is recommended. Finally the outcome of the study provides a baseline for further and extensive research into the underlying molecular factors of the evolving resistance in Ghana.

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