**TITLE:** COLONIZATION BY MULTIDRUG RESISTANT ENTEROBACTERIACEAE IN PATIENTS IN DIRECT CONTACT WITH HEALTH CARE ENVIRONMENTS: MONTE CARLO SIMULATIONS TO EXPLORE POTENTIAL COMPARATIVE EFFICACY OF 6 THERAPEUTIC REGIMENS

**AUTHORS:** [1]REZENDE, T.F.T.; [1]SAKATA, R.A.P.; [1]CUBA, G.T.; [1]DOI, A.M.; [1]FEHLBERG, L.C.C.; [2]MANFREDI, S.; [2]GROTHE, C., [2]TAMINATO, M.; [1]KIFFER, C.R.V.; [1]PIGNATARI, A.C.C; [2]BARBOSA, D.A.

**INSTITUTION:** 1. Special Clinical Microbiology Laboratory (LEMC/ALERTA), Federal University of São Paulo/UNIFESP/Brazil, São Paulo, Brazil.

2. Kidney and Hypertension Hospital/UNIFESP, São Paulo, Brazil.

**Background:** Colonization by multidrug resistant Enterobacteriacea (EMDR) increases the risk of infection and contributes to the spread of antimicrobial resistance especially in health care settings. Patients in direct contact with health care settings have a high risk of acquiring and disseminating resistances. Surveillance cultures are recommended as part of infection control programs. Colonization by EMDRs may pose risk for antimicrobial treatment selection, affecting the choice of ideal treatments when they become infected. **Objective:** Determine the pharmacodynamic target attainments (PTA) and cumulative fractions of response (CFR) by Monte Carlo simulation (MCS) of various therapeutic agents against EMDR isolates from a colonized population. **Methods:** A total of 1092 rectal ESwab™ were collected at two different time points (admission and 14 days) of 546 patients at a tertiary care university center, from October 2013 to February 2015**.** Rectal swabs were sown on chromogenic agar (CA) (Probac, Brazil) and minimum inhibitory concentration (MIC) by agar dilution technique was applied for *Enterobacter cloacae*, *Escherichia coli* and *Klebsiella pneumoniae* according to CLSI 2015 or EUCAST 2015. Isolates were identified by MALDI-TOF. A 5000-subject MCS was applied to calculate the PTAs for ciprofloxacin, ceftriaxone, ertapenem, meropenem, piperacillin/tazobactam and tigecycline and CFRs were then determined against all isolates. **Results:** There were 130 (12%) Enterobacteriacea isolates, with 63 (48.5%) *E. coli*, 64 (49.2%) *K. pneumoniae* and 3 (2.3%) *E. cloacae,* of which 66 (50.8%) were from the first collection and 64 (49.2%) from the second. The antimicrobial susceptibility showed resistance to tigecycline in 9.1% (12), 33% (43) for piperacillin-tazobactam and meropenem, 50% (65) to ciprofloxacin and ceftriaxone, and 66% (86) for ertapenem. Among the antibiotic regimens submitted to MCS, ciprofloxacin, ceftriaxone, ertapenem, meropenem and tigecycline failed to achieve CFRs > 90% for all isolates. **Conclusion:** No antibiotic regimens presented CFRs above 90% against the isolates of this colonized population. Thus, the selection of potential empiric treatment options when this population becomes infected should rely on the highest CFRs observed. MCS provides good treatment profiling, making it an appropriate tool for the implementation of adequate treatment options against potential infectious agents.

**Keywords**: Monte Carlos simulation, Enterobacteriaceae, multidrug resitant.

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