Introduction:
This study assessed whether empiric combination antibiotic therapy directed against Gram-negative bacteria is associated with lower intensive care unit (ICU) mortality compared to single antibiotic therapy.

Methods:
Retrospective cohort study on prospectively collected data conducted in the ICU of a tertiary care hospital in India between July 2016 to March 2017. All consecutive infection episodes treated with empiric antibiotic therapy and with subsequent positive culture for Gram-negative bacteria were included. Primary and secondary outcomes were all cause ICU mortality and ICU length of stay (LOS). Outcomes were compared between infection episodes treated with single vs. combination antibiotic therapy.

Results:
Of total 214 episodes of gram-negative infections 66.4% received combination-antibiotic therapy. Baseline demographic and clinical characteristics between single vs. combination therapy groups were similar (mean age: p=0.07; sex: p=0.3; mean APACHE IV score: p=0.07). Overall ICU mortality did not significantly differ between single and combination antibiotic groups (30.2% vs. 27%; p=0.7). In single antibiotic group, ICU mortality was significantly higher for antibiotic-resistant compared to antibiotic-sensitive bacteria (77.8% vs. 18.5%, p=0.0002). In combination group, significantly lower ICU mortality was noted if bacteria was sensitive to even one antibiotic compared to pan-resistant bacteria (21.4% vs. 63.6%, p=0.0001). ICU LOS was similar between antibiotic-sensitive bacteria and antibiotic-resistant bacteria, both in single and combination therapy groups (single, antibiotic-sensitive vs. antibiotic-resistant: mean LOS±SD 14.6±12.7 vs. 12.8±11 days; p=0.6; combination, antibiotic-sensitive vs. antibiotic-resistant: 15.5±13.3 vs. 11.2 days; p=0.1).

Conclusion:
Irrespective of the number of antibiotics prescribed as empiric therapy, outcome of patients solely depends on the sensitivity pattern of the bacteria isolated.