

Attributable Mortality of Nosocomial Infection: A Nested Case Control Study in Tunisia

Authors : S. Ben Fredj, H. Ghali, M. Ben Rejeb, S. Layouni, S. Khfacha, L. Dhidah, H. Said

Abstract : Background: The Intensive Care Unit (ICU) provides continuous care and uses a high level of treatment technologies. Although developed country hospitals allocate only 5-10% of beds in critical care areas, approximately 20% of nosocomial infections (NI) occur among patients treated in ICUs. Whereas in the developing countries the situation is still less accurate. The aim of our study is to assess mortality rates in ICUs and to determine its predictive factors. Methods: We carried out a nested case-control study in a 630-beds public tertiary care hospital in Eastern Tunisia. We included in the study all patients hospitalized for more than two days in the surgical or medical ICU during the entire period of the surveillance. Cases were patients who died before ICU discharge, whereas controls were patients who survived to discharge. NIs were diagnosed according to the definitions of 'Comité Technique des Infections Nosocomiales et les Infections Liées aux Soins' (CTINLIS, France). Data collection was based on the protocol of Rea-RAISIN 2009 of the National Institute for Health Watch (InVS, France). Results: Overall, 301 patients were enrolled from medical and surgical ICUs. The mean age was 44.8 ± 21.3 years. The crude ICU mortality rate was 20.6% (62/301). It was 35.8% for patients who acquired at least one NI during their stay in ICU and 16.2% for those without any NI, yielding an overall crude excess mortality rate of 19.6% (OR= 2.9, 95% CI, 1.6 to 5.3). The population-attributable fraction due to ICU-NI in patients who died before ICU discharge was 23.46% (95% CI, 13.43%-29.04%). Overall, 62 case-patients were compared to 239 control patients for the final analysis. Case patients and control patients differed by age ($p=0.003$), simplified acute physiology score II ($p < 10^{-3}$), NI ($p < 10^{-3}$), nosocomial pneumonia ($p=0.008$), infection upon admission ($p=0.002$), immunosuppression ($p=0.006$), days of intubation ($p < 10^{-3}$), tracheostomy ($p=0.004$), days with urinary catheterization ($p < 10^{-3}$), days with CVC ($p=0.03$), and length of stay in ICU ($p=0.003$). Multivariate analysis demonstrated 3 factors: age older than 65 years (OR, 5.78 [95% CI, 2.03-16.05] $p=0.001$), duration of intubation 1-10 days (OR, 6.82 [95% CI, [1.90-24.45] $p=0.003$), duration of intubation > 10 days (OR, 11.11 [95% CI, [2.85-43.28] $p=0.001$), duration of CVC 1-7 days (OR, 6.85[95% CI, [1.71-27.45] $p=0.007$) and duration of CVC > 7 days (OR, 5.55[95% CI, [1.70-18.04] $p=0.004$). Conclusion: While surveillance provides important baseline data, successful trials with more active intervention protocols, adopting multimodal approach for the prevention of nosocomial infection incited us to think about the feasibility of similar trial in our context. Therefore, the implementation of an efficient infection control strategy is a crucial step to improve the quality of care.

Keywords : intensive care unit, mortality, nosocomial infection, risk factors

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