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Healthcare Associated Infections in an Intensive Care Unit in Tunisia: Incidence and Risk Factors

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Abstract : Background: Hospital acquired infections (HAI) cause significant morbidity, mortality, length of stay and hospital costs, especially in the intensive care unit (ICU), because of the debilitated immune systems of their patients and exposure to invasive devices. The aims of this study were to determine the rate and the risk factors of HAI in an ICU of a university hospital in Tunisia. Materials/Methods: A prospective study was conducted in the 8-bed adult medical ICU of a University Hospital (Sousse Tunisia) during 14 months from September 15th, 2015 to November 15th, 2016. Patients admitted for more than 48h were included. Their surveillance was stopped after the discharge from ICU or death. HAIs were defined according to standard Centers for Disease Control and Prevention criteria. Risk factors were analyzed by conditional stepwise logistic regression. The p-value of < 0.05 was considered significant. Results: During the study, 192 patients had admitted for more than 48 hours. Their mean age was 59.3± 18.20 years and 57.1% were male. Acute respiratory failure was the main reason of admission (72%). The mean SAPS II score calculated at admission was 32.5 ± 14 (range: 6 - 78). The exposure to the mechanical ventilation (MV) and the central venous catheter were observed in 169 (88 %) and 144 (75 %) patients, respectively. Seventy-three patients (38.02%) developed 94 HAIs. The incidence density of HAIs was 41.53 per 1000 patient day. Mortality rate in patients with HAIs was 65.8 %(n= 48). Regarding the type of infection, Ventilator Associated Pneumoniae (VAP) and central venous catheter Associated Infections (CVC AI) were the most frequent with Incidence density: 14.88/1000 days of MV for VAP and 20.02/1000 CVC days for CVC AI. There were 5 Peripheral Venous Catheter Associated Infections, 2 urinary tract infections, and 21 other HAIs. Gram-negative bacteria were the most common germs identified in HAIs: Multidrug resistant Acinetobacter Baumanii (45%) and Klebsiella pneumoniae (10.96%) were the most frequently isolated. Univariate analysis showed that transfer from another hospital department (p= 0.001), intubation (p < 10-4), tracheostomy (p < 10-4), age (p=0.028), grade of acute respiratory failure (p=0.01), duration of sedation (p < 10-4), number of CVC (p < 10-4), length of mechanical ventilation (p < 10-4) and length of stay (p < 10-4), were associated to high risk of HAIS in ICU. Multivariate analysis reveals that independent risk factors for HAIs are: transfer from another hospital department: OR=13.44, IC 95% [3.9, 44.2], p < 10-4, duration of sedation: OR= 1.18, IC 95% [1.049, 1.325], p=0.006, high number of CVC: OR=2.78, IC 95% [1.73, 4.487], p < 10-4, and length of stay in ICU: OR= 1.14, IC 95% [1.066,1.22], p < 10-4. Conclusion: Prevention of nosocomial infections in ICUs is a priority of health care systems all around the world. Yet, their control requires an understanding of epidemiological data collected in these units.

Keywords : healthcare associated infections, incidence, intensive care unit, risk factors
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